097517O8_131502   #12

SEQUENCE LISTING

<110> TERMAN, David S

<120> COMPOSITIONS AND METHODS FOR TREATMENT OF NEOPLASTIC DISEASE

<130> 751708

<140> US 09/751,708
<141> 2000-12-28

<150> US 60/173,371
<151> 1999-12-28

<160> 166

<170> PatentIn version 3.1

<210> 1
<211> 801
<212> DNA
<213> Staphylococcus sp.

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tcgagtaaat tcactggttt gatggaaaat atgaaagttt tgtatgatga taatcatgta   180

tcagcaataa acgttaaatc tatagatcaa tttctatact ttgacttaat atattctatt   240

aaggacacta agttagggaa ttatgataat gttcgagtcg aatttaaaaa caaagattta   300

gctgataaat acaaagataa atacgtagat gtgtttggag ctaattatta ttatcaatgt   360

tattttcta aaaaaacgaa tgatattaat tcgcatcaaa ctgacaaacg aaaaacttgt   420

atgtatggtg gtgtaactga gcataatgga aaccaattag ataaatatag aagtattact   480

gttcgggtat ttgaagatgg taaaaattta ttatcttttg acgtacaaac taataagaaa   540

aaggtgactg ctcaagaatt agattaccta actcgtcact atttggtgaa aaataaaaaa   600

ctctatgaat ttaacaactc gccttatgaa acgggatata ttaaatttat agaaaatgag   660

aatagctttt ggtatgacat gatgcctgca ccaggagata aatttgacca atctaaatat   720

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gcagagagtc aaccagatcc taaaccagat gagttgcaca aatcgagtaa attcactggt     180

ttgatggaaa atatgaaagt tttgtatgat gataatcatg tatcagcaat aaacgttaaa     240

tctatagatc aatttctata ctttgactta atatattcta ttaaggacac taagttaggg     300

aattatgata atgttcgagt cgaatttaaa aacaaagatt tagctgataa atacaaagat     360

aaatacgtag atgtgtttgg agctaattat tattatcaat gttatttttc taaaaaaacg     420

aatgatatta attcgcatca aactgacaaa cgaaaaactt gtatgtatgg tggtgtaact     480

gagcataatg gaaaccaatt agataaatat agaagtatta ctgttcgggt atttgaagat     540

ggtaaaaatt tattatcttt tgacgtacaa actaataaga aaaaggtgac tgctcaagaa     600

ttagattacc taactcgtca ctatttggtg aaaaataaaa aactctatga atttaacaac     660

tcgccttatg aaacgggata tattaaattt atagaaaatg agaatagctt ttggtatgac     720

atgatgcctg caccaggaga taaatttgac caatctaaat atttaatgat gtacaatgac     780

aataaaatgg ttgattctaa agatgtgaag attgaagttt atcttacgac aaagaaaaag     840

tgaggatcca gacatgataa gataccttga tgagtttgga caaacc                   886
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atatatgtat gtataagtaa ataatgataa ttctataatt attgtatata actaataatt  180

acttcgacaa aaataatcta ttatccaaat attttagata ataaaaagtt tgtatggaat  240
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tatgctttag aggtgagcaa a atg aaa aaa aca gca ttt ata cta ctt tta      291
                          Met Lys Lys Thr Ala Phe Ile Leu Leu Leu
                          1              5                   10

ttc att gcc cta acg tgg aca aca agt cca ctt gta aat ggt agc gag      339
Phe Ile Ala Leu Thr Trp Thr Thr Ser Pro Leu Val Asn Gly Ser Glu
                15              20                  25

aaa agc gaa gaa ata aat gaa aaa gat ttg cga aaa aag tct gaa ttg      387
Lys Ser Glu Glu Ile Asn Glu Lys Asp Leu Arg Lys Lys Ser Glu Leu
            30                  35                  40

cag gga gca gct tta ggc aat ctt aaa caa atc tat tat tac aat gaa      435
Gln Gly Ala Ala Leu Gly Asn Leu Lys Gln Ile Tyr Tyr Tyr Asn Glu
            45                  50                  55

aaa gct aaa act gaa aat aaa gag agt cac gat caa ttt tta cag cat      483
Lys Ala Lys Thr Glu Asn Lys Glu Ser His Asp Gln Phe Leu Gln His
        60                  65                  70

act ata ttg ttt aaa ggc ttt ttt aca aat cat tca tgg tat aac gat      531
Thr Ile Leu Phe Lys Gly Phe Phe Thr Asn His Ser Trp Tyr Asn Asp
75                  80                  85                  90

tta tta gta gat ttt gat tca aag gat att gtt gat aaa tat aaa ggg      579
Leu Leu Val Asp Phe Asp Ser Lys Asp Ile Val Asp Lys Tyr Lys Gly
                95                  100                 105

aaa aaa gta gac tta tat ggt gct tat tat ggt tat caa tgt gcg ggt      627
Lys Lys Val Asp Leu Tyr Gly Ala Tyr Tyr Gly Tyr Gln Cys Ala Gly
            110                 115                 120

ggt aca cca aac aaa aca gct tgc atg tat ggt ggt gta acg tta cat      675
Gly Thr Pro Asn Lys Thr Ala Cys Met Tyr Gly Gly Val Thr Leu His
            125                 130                 135

gat aat aat cga ttg acc gaa gag aaa aaa gtg ccg atc aat tta tgg      723
Asp Asn Asn Arg Leu Thr Glu Glu Lys Lys Val Pro Ile Asn Leu Trp
    140                 145                 150

cta gac ggt aaa caa aat aca gta cct ttg gaa acg gtt aaa acg aat      771
Leu Asp Gly Lys Gln Asn Thr Val Pro Leu Glu Thr Val Lys Thr Asn
155                 160                 165                 170

aag aaa aat gta act gtt cag gag ttg gat ctt caa gca aga cgt tat      819
Lys Lys Asn Val Thr Val Gln Glu Leu Asp Leu Gln Ala Arg Arg Tyr
                175                 180                 185

tta cag gaa aaa tat aat tta tat aac tct gat gtt ttt gat ggg aag      867
Leu Gln Glu Lys Tyr Asn Leu Tyr Asn Ser Asp Val Phe Asp Gly Lys
            190                 195                 200

gtt cag agg gga tta atc gtg ttt cat act tct aca gaa cct tcg gtt      915
Val Gln Arg Gly Leu Ile Val Phe His Thr Ser Thr Glu Pro Ser Val
            205                 210                 215
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4

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aat tac gat tta ttt ggt gct caa gga cag aat tca aat aca cta tta      963
Asn Tyr Asp Leu Phe Gly Ala Gln Gly Gln Asn Ser Asn Thr Leu Leu
    220             225             230

aga ata tat aga gat aat aaa acg att aac tct gaa aac atg cat att     1011
Arg Ile Tyr Arg Asp Asn Lys Thr Ile Asn Ser Glu Asn Met His Ile
235             240             245             250

gat ata tat tta tat aca agt taaacatggt agttttgaac acgtaatgtt        1062
Asp Ile Tyr Leu Tyr Thr Ser
                255

cagattatta tgaaccgaga ataatctgaa agtttacaag cagtaaaaaa agtatatgtg   1122

ctataatatg ctttgagcaa gttggataga tggtggctat ctgagtataa ggaggtggtg   1182

cctatggtgg cattactgaa atctttagaa aggagacgcc taatgattac aattagtacc   1242

aatgttgcag tttggtttat tccttattgc attgataggt ctagtaatca agcttattga   1302

attaagcaat aaaaaataac catcgctaac tttggctggt ttcgatggtt aaatggttat   1362

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<212>   PRT
<213>   Staphylococcus aureus

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Met Lys Lys Thr Ala Phe Ile Leu Leu Leu Phe Ile Ala Leu Thr Trp
1               5               10              15


Thr Thr Ser Pro Leu Val Asn Gly Ser Glu Lys Ser Glu Glu Ile Asn
            20              25              30


Glu Lys Asp Leu Arg Lys Lys Ser Glu Leu Gln Gly Ala Ala Leu Gly
        35              40              45


Asn Leu Lys Gln Ile Tyr Tyr Tyr Asn Glu Lys Ala Lys Thr Glu Asn
    50              55              60


Lys Glu Ser His Asp Gln Phe Leu Gln His Thr Ile Leu Phe Lys Gly
65              70              75              80
```

5

```
Phe Phe Thr Asn His Ser Trp Tyr Asn Asp Leu Leu Val Asp Phe Asp
                85              90                  95

Ser Lys Asp Ile Val Asp Lys Tyr Lys Gly Lys Lys Val Asp Leu Tyr
            100             105             110

Gly Ala Tyr Tyr Gly Tyr Gln Cys Ala Gly Gly Thr Pro Asn Lys Thr
            115             120             125

Ala Cys Met Tyr Gly Gly Val Thr Leu His Asp Asn Asn Arg Leu Thr
    130             135             140

Glu Glu Lys Lys Val Pro Ile Asn Leu Trp Leu Asp Gly Lys Gln Asn
145             150             155             160

Thr Val Pro Leu Glu Thr Val Lys Thr Asn Lys Lys Asn Val Thr Val
            165             170             175

Gln Glu Leu Asp Leu Gln Ala Arg Arg Tyr Leu Gln Glu Lys Tyr Asn
            180             185             190

Leu Tyr Asn Ser Asp Val Phe Asp Gly Lys Val Gln Arg Gly Leu Ile
        195             200             205

Val Phe His Thr Ser Thr Glu Pro Ser Val Asn Tyr Asp Leu Phe Gly
    210             215             220

Ala Gln Gly Gln Asn Ser Asn Thr Leu Leu Arg Ile Tyr Arg Asp Asn
225             230             235             240

Lys Thr Ile Asn Ser Glu Asn Met His Ile Asp Ile Tyr Leu Tyr Thr
            245             250             255

Ser
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<210> 9
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<212> DNA
<213> Staphylococcus aureus

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atgagattat taaatataat taagtttctt ttaatgtttt tttaattgaa tatttaagat       180

tataacatat atttaaagtg tatctagata cttttttggga atgttggata aaggagataa      240
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aaa atg tat aag aga tta ttt att tca cat gta att ttg ata ttc gca        288
    Met Tyr Lys Arg Leu Phe Ile Ser His Val Ile Leu Ile Phe Ala
    1               5                  10                  15

ctg ata tta gtt att tct aca ccc aac gtt tta gca gag agt caa cca        336
Leu Ile Leu Val Ile Ser Thr Pro Asn Val Leu Ala Glu Ser Gln Pro
                20                  25                  30

gat cct aaa cca gat gag ttg cac aaa tcg agt aaa ttc act ggt ttg        384
Asp Pro Lys Pro Asp Glu Leu His Lys Ser Ser Lys Phe Thr Gly Leu
            35                  40                  45

atg gaa aat atg aaa gtt ttg tat gat gat aat cat gta tca gca ata        432
Met Glu Asn Met Lys Val Leu Tyr Asp Asp Asn His Val Ser Ala Ile
        50                  55                  60

aac gtt aaa tct ata gat caa ttt cta tac ttt gac tta ata tat tct        480
Asn Val Lys Ser Ile Asp Gln Phe Leu Tyr Phe Asp Leu Ile Tyr Ser
    65                  70                  75

att aag gac act aag tta ggg aat tat gat aat gtt cga gtc gaa ttt        528
Ile Lys Asp Thr Lys Leu Gly Asn Tyr Asp Asn Val Arg Val Glu Phe
80                  85                  90                  95

aaa aac aaa gat tta gct gat aaa tac aaa gat aaa tac gta gat gtg        576
Lys Asn Lys Asp Leu Ala Asp Lys Tyr Lys Asp Lys Tyr Val Asp Val
                100                 105                 110

ttt gga gct aat tat tat tat caa tgt tat ttt tct aaa aaa acg aat        624
Phe Gly Ala Asn Tyr Tyr Tyr Gln Cys Tyr Phe Ser Lys Lys Thr Asn
                115                 120                 125

gat att aat tcg cat caa act gac aaa cga aaa act tgt atg tat ggt        672
Asp Ile Asn Ser His Gln Thr Asp Lys Arg Lys Thr Cys Met Tyr Gly
        130                 135                 140

ggt gta act gag cat aat gga aac caa tta gat aaa tat aga agt att        720
Gly Val Thr Glu His Asn Gly Asn Gln Leu Asp Lys Tyr Arg Ser Ile
    145                 150                 155
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7

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act gtt cgg gta ttt gaa gat ggt aaa aat tta tta tct ttt gac gta        768
Thr Val Arg Val Phe Glu Asp Gly Lys Asn Leu Leu Ser Phe Asp Val
160                 165             170             175

caa act aat aag aaa aag gtg act gct caa gaa tta gat tac cta act        816
Gln Thr Asn Lys Lys Lys Val Thr Ala Gln Glu Leu Asp Tyr Leu Thr
                180             185             190

cgt cac tat ttg gtg aaa aat aaa aaa ctc tat gaa ttt aac aac tcg        864
Arg His Tyr Leu Val Lys Asn Lys Lys Leu Tyr Glu Phe Asn Asn Ser
                195             200             205

cct tat gaa acg gga tat att aaa ttt ata gaa aat gag aat agc ttt        912
Pro Tyr Glu Thr Gly Tyr Ile Lys Phe Ile Glu Asn Glu Asn Ser Phe
            210             215             220

tgg tat gac atg atg cct gca cca gga gat aaa ttt gac caa tct aaa        960
Trp Tyr Asp Met Met Pro Ala Pro Gly Asp Lys Phe Asp Gln Ser Lys
        225             230             235

tat tta atg atg tac aat gac aat aaa atg gtt gat tct aaa gat gtg        1008
Tyr Leu Met Met Tyr Asn Asp Asn Lys Met Val Asp Ser Lys Asp Val
240             245             250             255

aag att gaa gtt tat ctt acg aca aag aaa aag tga aattatattt            1054
Lys Ile Glu Val Tyr Leu Thr Thr Lys Lys Lys
            260             265


tagaaaagta aatatgaaga gttagtaatt aaggcaggca cttatagagt acctgccttt     1114

tctaatatta tttagttata gttatttttg ttatatctct ctgatttagc attaacccct     1174

tgttgccatt atagttttca ccaactttag ctgaaattgg gggatcattt ttatctttac     1234

tatggatagt tactgtgtcg ccgtttttaa cgatttgttt ctcttttaat ttgtcagtta     1294

attttttcca tgcatcattt gcgtcaaacc tatttccatt tggatttatt cttgacaaat     1354

caattctttt aacactatcg gtattaatcg gcttgttatt aaaattacta agttcatcta     1414

aatcagctgt acccgtaata ctactttcgc caccattatt taaattgtac gtaacaccaa     1474

ctgtctċatt tgctgtttta tcgataatat ttgcttcttt caaagcatct cttacatttt     1534

tccataagtc tctatctgtt atttcagaag cctttgcaac gttattaata ccattataat     1594

ttgaagaaga atgaaaacct gaacctactg ttgttaaaac taaagcactt gctatcaatg     1654

ttcttgttaa tagtttttta ttcattttat tttctcctat aacttatttg caatcgat       1712
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<210>  10
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<212>  PRT
<213>  Staphylococcus aureus
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8

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Met Tyr Lys Arg Leu Phe Ile Ser His Val Ile Leu Ile Phe Ala Leu
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Ile Leu Val Ile Ser Thr Pro Asn Val Leu Ala Glu Ser Gln Pro Asp
            20   25   30

Pro Lys Pro Asp Glu Leu His Lys Ser Ser Lys Phe Thr Gly Leu Met
        35   40   45

Glu Asn Met Lys Val Leu Tyr Asp Asp Asn His Val Ser Ala Ile Asn
    50   55   60

Val Lys Ser Ile Asp Gln Phe Leu Tyr Phe Asp Leu Ile Tyr Ser Ile
65   70   75   80

Lys Asp Thr Lys Leu Gly Asn Tyr Asp Asn Val Arg Val Glu Phe Lys
            85   90   95

Asn Lys Asp Leu Ala Asp Lys Tyr Lys Asp Lys Tyr Val Asp Val Phe
            100   105   110

Gly Ala Asn Tyr Tyr Tyr Gln Cys Tyr Phe Ser Lys Lys Thr Asn Asp
        115   120   125

Ile Asn Ser His Gln Thr Asp Lys Arg Lys Thr Cys Met Tyr Gly Gly
    130   135   140

Val Thr Glu His Asn Gly Asn Gln Leu Asp Lys Tyr Arg Ser Ile Thr
145   150   155   160

Val Arg Val Phe Glu Asp Gly Lys Asn Leu Leu Ser Phe Asp Val Gln
            165   170   175

Thr Asn Lys Lys Lys Val Thr Ala Gln Glu Leu Asp Tyr Leu Thr Arg
        180   185   190

His Tyr Leu Val Lys Asn Lys Lys Leu Tyr Glu Phe Asn Asn Ser Pro
        195   200   205

9

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Tyr Glu Thr Gly Tyr Ile Lys Phe Ile Glu Asn Glu Asn Ser Phe Trp
    210             215             220

Tyr Asp Met Met Pro Ala Pro Gly Asp Lys Phe Asp Gln Ser Lys Tyr
225             230             235             240

Leu Met Met Tyr Asn Asp Asn Lys Met Val Asp Ser Lys Asp Val Lys
                245             250             255

Ile Glu Val Tyr Leu Thr Thr Lys Lys Lys
                260             265
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<213> Staphylococcus aureus

<220>
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<222> (118)..(918)
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atg aat aag agt cga ttt att tca tgc gta att ttg ata ttc gca ctt      165
Met Asn Lys Ser Arg Phe Ile Ser Cys Val Ile Leu Ile Phe Ala Leu
  1           5                   10                  15

ata cta gtt ctt ttt aca ccc aac gta tta gca gag agc caa cca gac      213
Ile Leu Val Leu Phe Thr Pro Asn Val Leu Ala Glu Ser Gln Pro Asp
            20                  25                  30

cct acg cca gat gag ttg cac aaa gcg agt aaa ttc act ggt ttg atg      261
Pro Thr Pro Asp Glu Leu His Lys Ala Ser Lys Phe Thr Gly Leu Met
            35                  40                  45

gaa aat atg aaa gtt tta tat gat gat cat tat gta tca gca act aaa      309
Glu Asn Met Lys Val Leu Tyr Asp Asp His Tyr Val Ser Ala Thr Lys
        50                  55                  60

gtt aag tct gta gat aaa ttt ttg gca cat gat tta att tat aac att      357
Val Lys Ser Val Asp Lys Phe Leu Ala His Asp Leu Ile Tyr Asn Ile
65                  70                  75                  80

agt gat aaa aaa ctg aaa aat tat gac aaa gtg aaa aca gag tta tta      405
Ser Asp Lys Lys Leu Lys Asn Tyr Asp Lys Val Lys Thr Glu Leu Leu
                85                  90                  95
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10

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aat gaa ggt tta gca aag aag tac aaa gat gaa gta gtt gat gtg tat        453
Asn Glu Gly Leu Ala Lys Lys Tyr Lys Asp Glu Val Val Asp Val Tyr
            100                 105                 110

gga tca aat tac tat gta aac tgc tat ttt tca tcc aaa gat aat gta        501
Gly Ser Asn Tyr Tyr Val Asn Cys Tyr Phe Ser Ser Lys Asp Asn Val
            115                 120                 125

ggt aaa gtt aca ggt ggc aaa act tgt atg tat gga gga ata aca aaa        549
Gly Lys Val Thr Gly Gly Lys Thr Cys Met Tyr Gly Gly Ile Thr Lys
    130                 135                 140

cat gaa gga aac cac ttt gat aat ggg aac tta caa aat gta ctt ata        597
His Glu Gly Asn His Phe Asp Asn Gly Asn Leu Gln Asn Val Leu Ile
145                 150                 155                 160

aga gtt tat gaa aat aaa aga aac aca att tct ttt gaa gtg caa act        645
Arg Val Tyr Glu Asn Lys Arg Asn Thr Ile Ser Phe Glu Val Gln Thr
                165                 170                 175

gat aag aaa agt gta aca gct caa gaa cta gac ata aaa gct agg aat        693
Asp Lys Lys Ser Val Thr Ala Gln Glu Leu Asp Ile Lys Ala Arg Asn
                180                 185                 190

ttt tta att aat aaa aaa aat ttg tat gag ttt aac agt tca cca tat        741
Phe Leu Ile Asn Lys Lys Asn Leu Tyr Glu Phe Asn Ser Ser Pro Tyr
            195                 200                 205

gaa aca gga tat ata aaa ttt att gaa aat aac ggc aat act ttt tgg        789
Glu Thr Gly Tyr Ile Lys Phe Ile Glu Asn Asn Gly Asn Thr Phe Trp
    210                 215                 220

tat gat atg atg cct gca cca ggc gat aag ttt gac caa tct aaa tat        837
Tyr Asp Met Met Pro Ala Pro Gly Asp Lys Phe Asp Gln Ser Lys Tyr
225                 230                 235                 240

tta atg atg tac aac gac aat aaa acg gtt gat tct aaa agt gtg aag        885
Leu Met Met Tyr Asn Asp Asn Lys Thr Val Asp Ser Lys Ser Val Lys
                245                 250                 255

ata gaa gtc cac ctt aca aca aag aat gga taa tgttaatccg attttgatat     938
Ile Glu Val His Leu Thr Thr Lys Asn Gly
                260                 265

aaaaagtgaa agtattagat atatttgaaa ggtaagtact tcggtgcttg cctttttagg      998

atgcatatat atagattaaa ccgcacttct atattaatag aaagtgcggt tatttataca     1058

ctcaatctaa actataataa ttggaatcat cttcaaa                              1095
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<210>  12
<211>  266
<212>  PRT
<213>  Staphylococcus aureus
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11

<400> 12

Met Asn Lys Ser Arg Phe Ile Ser Cys Val Ile Leu Ile Phe Ala Leu
1   5   10   15

Ile Leu Val Leu Phe Thr Pro Asn Val Leu Ala Glu Ser Gln Pro Asp
        20   25   30

Pro Thr Pro Asp Glu Leu His Lys Ala Ser Lys Phe Thr Gly Leu Met
        35   40   45

Glu Asn Met Lys Val Leu Tyr Asp Asp His Tyr Val Ser Ala Thr Lys
    50   55   60

Val Lys Ser Val Asp Lys Phe Leu Ala His Asp Leu Ile Tyr Asn Ile
65   70   75   80

Ser Asp Lys Lys Leu Lys Asn Tyr Asp Lys Val Lys Thr Glu Leu Leu
                85   90   95

Asn Glu Gly Leu Ala Lys Lys Tyr Lys Asp Glu Val Val Asp Val Tyr
            100   105   110

Gly Ser Asn Tyr Tyr Val Asn Cys Tyr Phe Ser Ser Lys Asp Asn Val
            115   120   125

Gly Lys Val Thr Gly Gly Lys Thr Cys Met Tyr Gly Gly Ile Thr Lys
    130   135   140

His Glu Gly Asn His Phe Asp Asn Gly Asn Leu Gln Asn Val Leu Ile
145   150   155   160

Arg Val Tyr Glu Asn Lys Arg Asn Thr Ile Ser Phe Glu Val Gln Thr
            165   170   175

Asp Lys Lys Ser Val Thr Ala Gln Glu Leu Asp Ile Lys Ala Arg Asn
            180   185   190

Phe Leu Ile Asn Lys Lys Asn Leu Tyr Glu Phe Asn Ser Ser Pro Tyr
        195   200   205

12

```
Glu Thr Gly Tyr Ile Lys Phe Ile Glu Asn Asn Gly Asn Thr Phe Trp
    210             215             220
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```
Tyr Asp Met Met Pro Ala Pro Gly Asp Lys Phe Asp Gln Ser Lys Tyr
225             230             235             240
```

```
Leu Met Met Tyr Asn Asp Asn Lys Thr Val Asp Ser Lys Ser Val Lys
                245             250             255
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Ile Glu Val His Leu Thr Thr Lys Asn Gly
            260             265
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<211> 1136
<212> DNA
<213> Staphylococcus aureus

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<222> (292)..(1068)
<223>

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aaaaaaggga ttcctatgtt tatagttggt acttctagga aggactagca tgtcttattt   120

cgaaatgctg atggttgtat taacaattat gagtttagtc ttaattagta atcaaaactc   180

tgaatgtatt gtctacataa tcggtgtaac aataatatat atccgaaaga ttaaagtact   240

ctataaaaga atcatttaaa ggtgctcaaa tttattgaaa aaaggtggaa t atg aaa   297
                                                      Met Lys
                                                        1
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```
aaa ttt aac att ctt att gca tta ctc ttt ttt act agt ttg gta ata    345
Lys Phe Asn Ile Leu Ile Ala Leu Leu Phe Phe Thr Ser Leu Val Ile
        5               10              15
```

```
tct cct tta aac gtt aaa gcc aat gaa aac att gat tca gta aaa gag    393
Ser Pro Leu Asn Val Lys Ala Asn Glu Asn Ile Asp Ser Val Lys Glu
    20              25              30
```

```
aaa gaa ttg cat aaa aaa tct gaa tta agt agt acc gcg cta aat aat    441
Lys Glu Leu His Lys Lys Ser Glu Leu Ser Ser Thr Ala Leu Asn Asn
35              40              45              50
```

```
atg aaa cat tct tat gca gat aaa aat cca ata ata gga gaa aat aaa    489
Met Lys His Ser Tyr Ala Asp Lys Asn Pro Ile Ile Gly Glu Asn Lys
                55              60              65
```

```
agt aca gga gat caa ttt tta gaa aat act ttg ctt tac aaa aaa ttt         537
Ser Thr Gly Asp Gln Phe Leu Glu Asn Thr Leu Leu Tyr Lys Lys Phe
            70                  75                  80

ttt act gac ctt atc aat ttt gaa gat tta tta ata aac ttc aat tca         585
Phe Thr Asp Leu Ile Asn Phe Glu Asp Leu Leu Ile Asn Phe Asn Ser
            85                  90                  95

aaa gaa atg gct caa cat ttc aaa tct aaa aat gta gat gtt tac cct         633
Lys Glu Met Ala Gln His Phe Lys Ser Lys Asn Val Asp Val Tyr Pro
            100                 105                 110

ata aga tat agc att aat tgt tat ggt ggt gaa ata gat agg act gct         681
Ile Arg Tyr Ser Ile Asn Cys Tyr Gly Gly Glu Ile Asp Arg Thr Ala
115                 120                 125                 130

tgt aca tat gga ggt gtc act cca cac gaa ggt aat aaa tta aaa gaa         729
Cys Thr Tyr Gly Gly Val Thr Pro His Glu Gly Asn Lys Leu Lys Glu
            135                 140                 145

cga aaa aaa ata cca atc aat ttg tgg ata aat ggt gta caa aaa gaa         777
Arg Lys Lys Ile Pro Ile Asn Leu Trp Ile Asn Gly Val Gln Lys Glu
            150                 155                 160

gtt tct tta gat aaa gtt caa aca gat aaa aaa aat gtt acc gta caa         825
Val Ser Leu Asp Lys Val Gln Thr Asp Lys Lys Asn Val Thr Val Gln
            165                 170                 175

gaa tta gat gca caa gca agg cgc tat ttg caa aag gat tta aaa ttg         873
Glu Leu Asp Ala Gln Ala Arg Arg Tyr Leu Gln Lys Asp Leu Lys Leu
            180                 185                 190

tat aat aat gat act ctc gga gga aaa ata cag cgc gga aaa ata gag         921
Tyr Asn Asn Asp Thr Leu Gly Gly Lys Ile Gln Arg Gly Lys Ile Glu
195                 200                 205                 210

ttt gat tct tct gat ggg tct aaa gtc tct tat gat tta ttt gat gtt         969
Phe Asp Ser Ser Asp Gly Ser Lys Val Ser Tyr Asp Leu Phe Asp Val
            215                 220                 225

aag ggt gat ttt ccc gaa aaa caa tta cga ata tac agt gat aat aaa        1017
Lys Gly Asp Phe Pro Glu Lys Gln Leu Arg Ile Tyr Ser Asp Asn Lys
            230                 235                 240

aca tta tcc aca gag cac ctt cat att gac atc tat tta tat gaa aag        1065
Thr Leu Ser Thr Glu His Leu His Ile Asp Ile Tyr Leu Tyr Glu Lys
            245                 250                 255

tag tcaattcaaa tactttaaca tcagacacta aagccatttc aaagaatgct            1118

aaagatttat taatcggt                                                   1136
```

14

<210> 14
<211> 258
<212> PRT
<213> Staphylococcus aureus

<400> 14

Met Lys Lys Phe Asn Ile Leu Ile Ala Leu Leu Phe Phe Thr Ser Leu
1   5   10   15

Val Ile Ser Pro Leu Asn Val Lys Ala Asn Glu Asn Ile Asp Ser Val
            20   25   30

Lys Glu Lys Glu Leu His Lys Lys Ser Glu Leu Ser Ser Thr Ala Leu
        35   40   45

Asn Asn Met Lys His Ser Tyr Ala Asp Lys Asn Pro Ile Ile Gly Glu
    50   55   60

Asn Lys Ser Thr Gly Asp Gln Phe Leu Glu Asn Thr Leu Leu Tyr Lys
65   70   75   80

Lys Phe Phe Thr Asp Leu Ile Asn Phe Glu Asp Leu Leu Ile Asn Phe
                85   90   95

Asn Ser Lys Glu Met Ala Gln His Phe Lys Ser Lys Asn Val Asp Val
            100   105   110

Tyr Pro Ile Arg Tyr Ser Ile Asn Cys Tyr Gly Gly Glu Ile Asp Arg
        115   120   125

Thr Ala Cys Thr Tyr Gly Gly Val Thr Pro His Glu Gly Asn Lys Leu
    130   135   140

Lys Glu Arg Lys Lys Ile Pro Ile Asn Leu Trp Ile Asn Gly Val Gln
145   150   155   160

Lys Glu Val Ser Leu Asp Lys Val Gln Thr Asp Lys Lys Asn Val Thr
                165   170   175

Val Gln Glu Leu Asp Ala Gln Ala Arg Arg Tyr Leu Gln Lys Asp Leu
            180   185   190

15

```
Lys Leu Tyr Asn Asn Asp Thr Leu Gly Gly Lys Ile Gln Arg Gly Lys
        195                 200                 205


Ile Glu Phe Asp Ser Ser Asp Gly Ser Lys Val Ser Tyr Asp Leu Phe
    210                 215                 220


Asp Val Lys Gly Asp Phe Pro Glu Lys Gln Leu Arg Ile Tyr Ser Asp
225                 230                 235                 240


Asn Lys Thr Leu Ser Thr Glu His Leu His Ile Asp Ile Tyr Leu Tyr
            245                 250                 255


Glu Lys
```

```
<210>  15
<211>  774
<212>  DNA
<213>  Staphylococcus aureus

<220>
<221>  CDS
<222>  (1)..(744)
<223>

 <400>  15
atg aaa aaa aca gca ttt ata cta ctt tta ttc att gcc cta acg ttg        48
Met Lys Lys Thr Ala Phe Ile Leu Leu Leu Phe Ile Ala Leu Thr Leu
1               5                   10                  15

aca aca agt cca ctt gta aat ggt agc gag aaa agc gaa gaa ata aat        96
Thr Thr Ser Pro Leu Val Asn Gly Ser Glu Lys Ser Glu Glu Ile Asn
            20                  25                  30

gaa aaa gat ttg cga aaa aag tct gaa tta caa aga aat gct tta agc       144
Glu Lys Asp Leu Arg Lys Lys Ser Glu Leu Gln Arg Asn Ala Leu Ser
        35                  40                  45

aat ctt agg caa att tat tat tat aat gaa aaa gct ata act gaa aac       192
Asn Leu Arg Gln Ile Tyr Tyr Tyr Asn Glu Lys Ala Ile Thr Glu Asn
    50                  55                  60

aaa gag agt gat gat cag ttt tta gag aat act ttg tta ttt aaa ggt       240
Lys Glu Ser Asp Asp Gln Phe Leu Glu Asn Thr Leu Leu Phe Lys Gly
65                  70                  75                  80

ttt ttc aca ggt cat cca tgg tat aac gat tta tta gta gat ctt ggt       288
Phe Phe Thr Gly His Pro Trp Tyr Asn Asp Leu Leu Val Asp Leu Gly
                85                  90                  95
```

```
tca aaa gat gct act aat aaa tat aaa ggg aaa aaa gta gac tta tat        336
Ser Lys Asp Ala Thr Asn Lys Tyr Lys Gly Lys Lys Val Asp Leu Tyr
        100             105             110

ggt gct tat tat gga tat caa tgt gct gga ggc aca cca aat aaa aca        384
Gly Ala Tyr Tyr Gly Tyr Gln Cys Ala Gly Gly Thr Pro Asn Lys Thr
        115             120             125

gca tgt atg tac ggg ggt gta aca tta cat gat aat aac cga ttg acc        432
Ala Cys Met Tyr Gly Gly Val Thr Leu His Asp Asn Asn Arg Leu Thr
        130             135             140

gaa gaa aaa aaa gta cca att aac ttg tgg ata gac gga aaa caa act        480
Glu Glu Lys Lys Val Pro Ile Asn Leu Trp Ile Asp Gly Lys Gln Thr
145             150             155             160

aca gta cct ata gat aaa gtt aaa aca agc aaa aaa gaa gta act gtt        528
Thr Val Pro Ile Asp Lys Val Lys Thr Ser Lys Lys Glu Val Thr Val
                165             170             175

caa gag cta gat ctt cag gca agg cat tat tta cac gga aaa ttt ggt        576
Gln Glu Leu Asp Leu Gln Ala Arg His Tyr Leu His Gly Lys Phe Gly
                180             185             190

tta tat aac tca gac agc ttt ggc ggt aag gtg caa aga ggc ttg att        624
Leu Tyr Asn Ser Asp Ser Phe Gly Gly Lys Val Gln Arg Gly Leu Ile
        195             200             205

gtg ttt cat tct tct gaa ggg tcc acg gta agt tat gat ttg ttt gat        672
Val Phe His Ser Ser Glu Gly Ser Thr Val Ser Tyr Asp Leu Phe Asp
        210             215             220

gct caa ggg caa tat cca gat aca tta tta aga att tac aga gat aat        720
Ala Gln Gly Gln Tyr Pro Asp Thr Leu Leu Arg Ile Tyr Arg Asp Asn
225                 230             235             240

aaa act att aat tca gag aac ctc catattgatt tgtatttata cacaacttga      774
Lys Thr Ile Asn Ser Glu Asn Leu
                245
```

```
<210>  16
<211>  248
<212>  PRT
<213>  Staphylococcus aureus

<400>  16

Met Lys Lys Thr Ala Phe Ile Leu Leu Leu Phe Ile Ala Leu Thr Leu
1               5                   10                  15


Thr Thr Ser Pro Leu Val Asn Gly Ser Glu Lys Ser Glu Glu Ile Asn
            20                  25                  30
```

```
Glu Lys Asp Leu Arg Lys Lys Ser Glu Leu Gln Arg Asn Ala Leu Ser
        35              40              45

Asn Leu Arg Gln Ile Tyr Tyr Tyr Asn Glu Lys Ala Ile Thr Glu Asn
        50              55                      60

Lys Glu Ser Asp Asp Gln Phe Leu Glu Asn Thr Leu Leu Phe Lys Gly
65                  70                  75                      80

Phe Phe Thr Gly His Pro Trp Tyr Asn Asp Leu Leu Val Asp Leu Gly
                85                  90                  95

Ser Lys Asp Ala Thr Asn Lys Tyr Lys Gly Lys Lys Val Asp Leu Tyr
            100             105             110

Gly Ala Tyr Tyr Gly Tyr Gln Cys Ala Gly Gly Thr Pro Asn Lys Thr
        115             120             125

Ala Cys Met Tyr Gly Gly Val Thr Leu His Asp Asn Asn Arg Leu Thr
    130             135             140

Glu Glu Lys Lys Val Pro Ile Asn Leu Trp Ile Asp Gly Lys Gln Thr
145             150             155             160

Thr Val Pro Ile Asp Lys Val Lys Thr Ser Lys Lys Glu Val Thr Val
            165             170             175

Gln Glu Leu Asp Leu Gln Ala Arg His Tyr Leu His Gly Lys Phe Gly
            180             185             190

Leu Tyr Asn Ser Asp Ser Phe Gly Gly Lys Val Gln Arg Gly Leu Ile
        195             200             205

Val Phe His Ser Ser Glu Gly Ser Thr Val Ser Tyr Asp Leu Phe Asp
    210             215             220

Ala Gln Gly Gln Tyr Pro Asp Thr Leu Leu Arg Ile Tyr Arg Asp Asn
225             230             235             240

Lys Thr Ile Asn Ser Glu Asn Leu
        245
```

18

<210> 17
<211> 731
<212> DNA
<213> Staphylococcus aureus

<220>
<221> CDS
<222> (16)..(720)
<223>

<400> 17

```
taaggagaat taaaa atg aat aaa aaa tta cta atg aat ttt ttt atc gta          51
                 Met Asn Lys Lys Leu Leu Met Asn Phe Phe Ile Val
                  1               5                  10


agc cct ttg ttg ctt gcg aca act gct aca gat ttt acc cct gtt ccc          99
Ser Pro Leu Leu Leu Ala Thr Thr Ala Thr Asp Phe Thr Pro Val Pro
         15              20                  25


tta tca tct aat caa ata atc aaa act gca aaa gca tct aca aac gat         147
Leu Ser Ser Asn Gln Ile Ile Lys Thr Ala Lys Ala Ser Thr Asn Asp
     30              35                  40


aat ata aag gat ttg cta gac tgg tat agt agt ggg tct gac act ttt         195
Asn Ile Lys Asp Leu Leu Asp Trp Tyr Ser Ser Gly Ser Asp Thr Phe
45                  50                  55                  60


aca aat agt gaa gtt tta gat aat tcc tta gga tct atg cgt ata aaa         243
Thr Asn Ser Glu Val Leu Asp Asn Ser Leu Gly Ser Met Arg Ile Lys
                 65                  70                  75


aac aca gat ggc agc atc agc ttg ata att ttt ccg agt cct tat tat         291
Asn Thr Asp Gly Ser Ile Ser Leu Ile Ile Phe Pro Ser Pro Tyr Tyr
             80                  85                  90


agc cct gct ttt aca aaa ggg gaa aaa gtt gac tta aac aca aaa aga         339
Ser Pro Ala Phe Thr Lys Gly Glu Lys Val Asp Leu Asn Thr Lys Arg
         95                  100                 105


act aaa aaa agc caa cat act agc gaa gga act tat atc cat ttc caa         387
Thr Lys Lys Ser Gln His Thr Ser Glu Gly Thr Tyr Ile His Phe Gln
     110                 115                 120


ata agt ggc gtt aca aat act gaa aaa tta cct act cca ata gaa cta         435
Ile Ser Gly Val Thr Asn Thr Glu Lys Leu Pro Thr Pro Ile Glu Leu
125                 130                 135                 140


cct tta aaa gtt aag gtt cat ggt aaa gat agc ccc tta aag tat ggg         483
Pro Leu Lys Val Lys Val His Gly Lys Asp Ser Pro Leu Lys Tyr Gly
                 145                 150                 155


cca aag ttc gat aaa aaa caa tta gct ata tca act tta gac ttt gaa         531
Pro Lys Phe Asp Lys Lys Gln Leu Ala Ile Ser Thr Leu Asp Phe Glu
             160                 165                 170
```

19

```
att cgt cat cag cta act caa ata cat gga tta tat cgt tca agc gat        579
Ile Arg His Gln Leu Thr Gln Ile His Gly Leu Tyr Arg Ser Ser Asp
        175                 180                 185

aaa acg ggt ggt tat tgg aaa ata aca atg aat gac gga tcc aca tat        627
Lys Thr Gly Gly Tyr Trp Lys Ile Thr Met Asn Asp Gly Ser Thr Tyr
        190                 195                 200

caa agt gat tta tct aaa aag ttt gaa tac aat act gaa aaa cca cct        675
Gln Ser Asp Leu Ser Lys Lys Phe Glu Tyr Asn Thr Glu Lys Pro Pro
205                 210                 215                 220

ata aat att gat gaa ata aaa act ata gaa gca gaa att aat taa        720
Ile Asn Ile Asp Glu Ile Lys Thr Ile Glu Ala Glu Ile Asn
                225                 230

tttaccactt t        731
```

<210> 18
<211> 234
<212> PRT
<213> Staphylococcus aureus

<400> 18

```
Met Asn Lys Lys Leu Leu Met Asn Phe Phe Ile Val Ser Pro Leu Leu
1               5                   10                  15


Leu Ala Thr Thr Ala Thr Asp Phe Thr Pro Val Pro Leu Ser Ser Asn
            20                  25                  30


Gln Ile Ile Lys Thr Ala Lys Ala Ser Thr Asn Asp Asn Ile Lys Asp
            35                  40                  45


Leu Leu Asp Trp Tyr Ser Ser Gly Ser Asp Thr Phe Thr Asn Ser Glu
    50                  55                  60


Val Leu Asp Asn Ser Leu Gly Ser Met Arg Ile Lys Asn Thr Asp Gly
65                  70                  75                  80


Ser Ile Ser Leu Ile Ile Phe Pro Ser Pro Tyr Tyr Ser Pro Ala Phe
                85                  90                  95


Thr Lys Gly Glu Lys Val Asp Leu Asn Thr Lys Arg Thr Lys Lys Ser
                100                 105                 110
```

20

```
Gln His Thr Ser Glu Gly Thr Tyr Ile His Phe Gln Ile Ser Gly Val
        115             120                 125

Thr Asn Thr Glu Lys Leu Pro Thr Pro Ile Glu Leu Pro Leu Lys Val
        130                 135                 140

Lys Val His Gly Lys Asp Ser Pro Leu Lys Tyr Gly Pro Lys Phe Asp
145                 150                 155                 160

Lys Lys Gln Leu Ala Ile Ser Thr Leu Asp Phe Glu Ile Arg His Gln
                165                 170                 175

Leu Thr Gln Ile His Gly Leu Tyr Arg Ser Ser Asp Lys Thr Gly Gly
            180                 185                 190

Tyr Trp Lys Ile Thr Met Asn Asp Gly Ser Thr Tyr Gln Ser Asp Leu
        195                 200                 205

Ser Lys Lys Phe Glu Tyr Asn Thr Glu Lys Pro Pro Ile Asn Ile Asp
    210                 215                 220

Glu Ile Lys Thr Ile Glu Ala Glu Ile Asn
225                 230
```

```
<210>  19
<211>  1031
<212>  DNA
<213>  Streptococcus pyogenes

<220>
<221>  CDS
<222>  (79)..(831)
<223>

<400>  19
attgttaata ataatggtta attgtaataa ccttttttaaa tctaaaggag aacccagata      60

taaaatggag gaatatta atg gaa aac aat aaa gaa gta ttg aag aaa atg      111
                    Met Glu Asn Asn Lys Glu Val Leu Lys Lys Met
                     1               5                  10

gta ttt ttt gtt tta atg aaa ttt ctt gga cta aca atc ttg cca aaa      159
Val Phe Phe Val Leu Met Lys Phe Leu Gly Leu Thr Ile Leu Pro Lys
        15                  20                  25
```

21

```
ggt att tgt tca aca aga ccc aag ccc agc caa tta caa aga tct aat        207
Gly Ile Cys Ser Thr Arg Pro Lys Pro Ser Gln Leu Gln Arg Ser Asn
        30              35              40

tta gtt aaa acc ttc aaa ata tat att ttc ttt atg agg gtg acc ctg        255
Leu Val Lys Thr Phe Lys Ile Tyr Ile Phe Phe Met Arg Val Thr Leu
        45              50              55

gtt act cac gag aat gtg aaa tct gtt gat caa ctt tta tca cac gat        303
Val Thr His Glu Asn Val Lys Ser Val Asp Gln Leu Leu Ser His Asp
60              65              70              75

tta ata tat aat gtt tca ggg cca aat tat gat aaa tta aaa act gaa        351
Leu Ile Tyr Asn Val Ser Gly Pro Asn Tyr Asp Lys Leu Lys Thr Glu
                80              85              90

ctt aag aac caa gag atg gca act tta ttt aag gat aaa aac gtt gat        399
Leu Lys Asn Gln Glu Met Ala Thr Leu Phe Lys Asp Lys Asn Val Asp
                95              100             105

att tat ggt gta gaa tat tac cat ctc tgt tat tta tgt gaa aat gca        447
Ile Tyr Gly Val Glu Tyr Tyr His Leu Cys Tyr Leu Cys Glu Asn Ala
        110             115             120

gaa agg agt gca tgt ctc tac gga ggg gta aca aat cat gaa ggg aat        495
Glu Arg Ser Ala Cys Leu Tyr Gly Gly Val Thr Asn His Glu Gly Asn
        125             130             135

cat tta gaa att cct aaa aag ata gtc gtt aaa gta tca atc gat ggt        543
His Leu Glu Ile Pro Lys Lys Ile Val Val Lys Val Ser Ile Asp Gly
140             145             150             155

atc caa agc cta tca ttt gat att gaa caa ata aaa aat ggt aac tgc        591
Ile Gln Ser Leu Ser Phe Asp Ile Glu Gln Ile Lys Asn Gly Asn Cys
                160             165             170

tca aga att agc tat aca gtt aga aaa tat ctt aca gat aat aag caa        639
Ser Arg Ile Ser Tyr Thr Val Arg Lys Tyr Leu Thr Asp Asn Lys Gln
        175             180             185

cta tat act aat gga cct tct aaa tat gaa act gga tat ata aag ttc        687
Leu Tyr Thr Asn Gly Pro Ser Lys Tyr Glu Thr Gly Tyr Ile Lys Phe
        190             195             200

ata cct aag aat aaa gaa agt ttt tgg ttt gat ttt ttc cct gaa cca        735
Ile Pro Lys Asn Lys Glu Ser Phe Trp Phe Asp Phe Phe Pro Glu Pro
        205             210             215

gaa ttt act caa tct aaa tat ctt atg ata tat aaa gat aat gaa acg        783
Glu Phe Thr Gln Ser Lys Tyr Leu Met Ile Tyr Lys Asp Asn Glu Thr
220             225             230             235

ctt gac tca aac aca agc caa att gaa gtc tac cta aca acc aag taa        831
Leu Asp Ser Asn Thr Ser Gln Ile Glu Val Tyr Leu Thr Thr Lys
                240             245             250
```

22

```
cttttgcttt tggcaacctt acctactgct ggatttagaa attttattgc aattctttta        891

ttaatgtaaa aacgctcatt tgatgagcgg ttttgtctta tctaaaggag ctttacctcc        951

taatgctgca aaattttaaa tgttggattt ttgtatttgt cattgtattt gatgggtaat       1011

cccattttc gacagacatc                                                     1031
```

<210> 20
<211> 250
<212> PRT
<213> Streptococcus pyogenes

<400> 20

```
Met Glu Asn Asn Lys Glu Val Leu Lys Lys Met Val Phe Phe Val Leu
1               5                   10                  15


Met Lys Phe Leu Gly Leu Thr Ile Leu Pro Lys Gly Ile Cys Ser Thr
            20                  25                  30


Arg Pro Lys Pro Ser Gln Leu Gln Arg Ser Asn Leu Val Lys Thr Phe
            35                  40                  45


Lys Ile Tyr Ile Phe Phe Met Arg Val Thr Leu Val Thr His Glu Asn
        50                  55                  60


Val Lys Ser Val Asp Gln Leu Leu Ser His Asp Leu Ile Tyr Asn Val
65                  70                  75                  80


Ser Gly Pro Asn Tyr Asp Lys Leu Lys Thr Glu Leu Lys Asn Gln Glu
                85                  90                  95


Met Ala Thr Leu Phe Lys Asp Lys Asn Val Asp Ile Tyr Gly Val Glu
                100                 105                 110


Tyr Tyr His Leu Cys Tyr Leu Cys Glu Asn Ala Glu Arg Ser Ala Cys
        115                 120                 125


Leu Tyr Gly Gly Val Thr Asn His Glu Gly Asn His Leu Glu Ile Pro
        130                 135                 140


Lys Lys Ile Val Val Lys Val Ser Ile Asp Gly Ile Gln Ser Leu Ser
145                 150                 155                 160
```

```
Phe Asp Ile Glu Gln Ile Lys Asn Gly Asn Cys Ser Arg Ile Ser Tyr
            165             170             175

Thr Val Arg Lys Tyr Leu Thr Asp Asn Lys Gln Leu Tyr Thr Asn Gly
            180             185             190

Pro Ser Lys Tyr Glu Thr Gly Tyr Ile Lys Phe Ile Pro Lys Asn Lys
            195             200             205

Glu Ser Phe Trp Phe Asp Phe Phe Pro Glu Pro Glu Phe Thr Gln Ser
    210             215             220

Lys Tyr Leu Met Ile Tyr Lys Asp Asn Glu Thr Leu Asp Ser Asn Thr
225             230             235             240

Ser Gln Ile Glu Val Tyr Leu Thr Thr Lys
            245             250
```

<210> 21
<211> 25
<212> DNA
<213> Unknown

<220>
<223> Primer

<400> 21
gggaattcca tggagagtca accag   25

<210> 22
<211> 21
<212> DNA
<213> Unknown

<220>
<223> Primer

<400> 22
gcaagcttaa cttgttaata g   21

<210> 23
<211> 22
<212> DNA
<213> Unknown

<220>
<223> Primer

<400> 23
gggaattcca tggagaaaag cg   22

<210> 24
<211> 22
<212> DNA
<213> Unknown

<220>
<223> Primer

<400> 24
gcggatcctc acttttcctt tg   22

<210> 25
<211> 50
<212> DNA
<213> Unknown

<220>
<223> Primer

<400> 25
ggggtacccc gaaggaggaa aaaaaaatgt ctacaaacga taatataaag   50

<210> 26
<211> 42
<212> DNA
<213> Unknown

<220>
<223> Primer

<400> 26
tgctctagag cattaattaa tttctgcttc tatagttttt at   42

<210> 27
<211> 1612
<212> DNA
<213> Escherichia coli

<220>
<221> CDS
<222> (200)..(1159)
<223>

<400> 27
agtcctcgat ggcggtccat tatctgcatt atgcgttgtt agctcagccg gacagagcaa   60

ttgccttctg agcaatcggt cactggttcg aatccagtac aacgcgccat atttatttac   120

25

```
caggctcgct tttgcgggcc ttttttatat ctgcgccggg tctggtgctg attacttcag      180

ccaaaaggaa cacctgtat atg aag tgt ata tta ttt aaa tgg gta ctg tgc      232
                     Met Lys Cys Ile Leu Phe Lys Trp Val Leu Cys
                      1               5                      10

ctg tta ctg ggt ttt tct tcg gta tcc tat tcc cgg gag ttt acg ata      280
Leu Leu Leu Gly Phe Ser Ser Val Ser Tyr Ser Arg Glu Phe Thr Ile
             15                  20                  25

gac ttt tcg acc caa caa agt tat gtc tct tcg tta aat agt ata cgg      328
Asp Phe Ser Thr Gln Gln Ser Tyr Val Ser Ser Leu Asn Ser Ile Arg
         30                  35                  40

aca gag ata tcg acc cct ctt gaa cat ata tct cag ggg acc aca tcg      376
Thr Glu Ile Ser Thr Pro Leu Glu His Ile Ser Gln Gly Thr Thr Ser
         45                  50                  55

gtg tct gtt att aac cac acc cca ccg ggc agt tat ttt gct gtg gat      424
Val Ser Val Ile Asn His Thr Pro Pro Gly Ser Tyr Phe Ala Val Asp
60                  65                  70                  75

ata cga ggg ctt gat gtc tat cag gcg cgt ttt gac cat ctt cgt ctg      472
Ile Arg Gly Leu Asp Val Tyr Gln Ala Arg Phe Asp His Leu Arg Leu
             80                  85                  90

att att gag caa aat aat tta tat gtg gcc ggg ttc gtt aat acg gca      520
Ile Ile Glu Gln Asn Asn Leu Tyr Val Ala Gly Phe Val Asn Thr Ala
             95                  100                 105

aca aat act ttc tac cgt ttt tca gat ttt aca cat ata tca gtg ccc      568
Thr Asn Thr Phe Tyr Arg Phe Ser Asp Phe Thr His Ile Ser Val Pro
         110                 115                 120

ggt gtg aca acg gtt tcc atg aca acg gac agc agt tat acc act ctg      616
Gly Val Thr Thr Val Ser Met Thr Thr Asp Ser Ser Tyr Thr Thr Leu
         125                 130                 135

caa cgt gtc gca gcg ctg gaa cgt tcc gga atg caa atc agt cgt cac      664
Gln Arg Val Ala Ala Leu Glu Arg Ser Gly Met Gln Ile Ser Arg His
140                 145                 150                 155

tca ctg gtt tca tca tat ctg gcg tta atg gag ttc agt ggt aat aca      712
Ser Leu Val Ser Ser Tyr Leu Ala Leu Met Glu Phe Ser Gly Asn Thr
                 160                 165                 170

atg acc aga gat gca tcc aga gca gtt ctg cgt ttt gtc act gtc aca      760
Met Thr Arg Asp Ala Ser Arg Ala Val Leu Arg Phe Val Thr Val Thr
             175                 180                 185

gca gaa gcc tta cgc ttc agg cag ata cag aga gaa ttt cgt cag gca      808
Ala Glu Ala Leu Arg Phe Arg Gln Ile Gln Arg Glu Phe Arg Gln Ala
         190                 195                 200
```

26

```
ctg tct gaa act gct cct gtg tat acg atg acg ccg gga gac gtg gac        856
Leu Ser Glu Thr Ala Pro Val Tyr Thr Met Thr Pro Gly Asp Val Asp
    205                 210                 215

ctc act ctg aac tgg ggg cga atc agc aat gtg ctt ccg gag tat cgg        904
Leu Thr Leu Asn Trp Gly Arg Ile Ser Asn Val Leu Pro Glu Tyr Arg
220                 225                 230                 235

gga gag gat ggt gtc aga gtg ggg aga ata tcc ttt aat aat ata tca        952
Gly Glu Asp Gly Val Arg Val Gly Arg Ile Ser Phe Asn Asn Ile Ser
                240                 245                 250

gcg ata ctg ggg act gtg gcc gtt ata ctg aat tgc cat cat cag ggg       1000
Ala Ile Leu Gly Thr Val Ala Val Ile Leu Asn Cys His His Gln Gly
                255                 260                 265

gcg cgt tct gtt cgc gcc gtg aat gaa gag agt caa cca gaa tgt cag       1048
Ala Arg Ser Val Arg Ala Val Asn Glu Glu Ser Gln Pro Glu Cys Gln
        270                 275                 280

ata act ggc gac agg cct gtt ata aaa ata aac aat aca tta tgg gaa       1096
Ile Thr Gly Asp Arg Pro Val Ile Lys Ile Asn Asn Thr Leu Trp Glu
        285                 290                 295

agt aat aca gct gca gcg ttt ctg aac aga aag tca cag ttt tta tat       1144
Ser Asn Thr Ala Ala Ala Phe Leu Asn Arg Lys Ser Gln Phe Leu Tyr
300                 305                 310                 315

aca acg ggt aaa taa aggagttaag catgaagaag atgtttatgg cggttttatt       1199
Thr Thr Gly Lys


tgcattagct tctgttaatg caatggcggc ggattgtgct aaaggtaaaa ttgagttttc      1259

caagtataat gaggatgaca catttacagt gaaggttgac gggaaagaat actggaccag      1319

tcgctggaat ctgcaaccgt tactgcaaag tgctcagttg acaggaatga ctgtcacaat      1379

caaatccagt acctgtgaat caggctccgg atttgctgaa gtgcagttta ataatgactg      1439

aggcataacc tgattcgtgg tatgtgggta acaagtgtaa tctgtgtcac aattcagtca      1499

gttgacagtt gcctgtcaga ctgagcattt gttaaaaaaa tttcgcatgg tgaatccccc      1559

tgtgtggagg ggcgactggt gaaaaatcct tgcttgtgat tcattatcga cac            1612
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<210> 28
<211> 319
<212> PRT
<213> Escherichia coli

27

<400> 28

Met Lys Cys Ile Leu Phe Lys Trp Val Leu Cys Leu Leu Leu Gly Phe
1   5   10   15

Ser Ser Val Ser Tyr Ser Arg Glu Phe Thr Ile Asp Phe Ser Thr Gln
            20   25   30

Gln Ser Tyr Val Ser Ser Leu Asn Ser Ile Arg Thr Glu Ile Ser Thr
            35   40   45

Pro Leu Glu His Ile Ser Gln Gly Thr Thr Ser Val Ser Val Ile Asn
        50   55   60

His Thr Pro Pro Gly Ser Tyr Phe Ala Val Asp Ile Arg Gly Leu Asp
65   70   75   80

Val Tyr Gln Ala Arg Phe Asp His Leu Arg Leu Ile Ile Glu Gln Asn
                85   90   95

Asn Leu Tyr Val Ala Gly Phe Val Asn Thr Ala Thr Asn Thr Phe Tyr
            100   105   110

Arg Phe Ser Asp Phe Thr His Ile Ser Val Pro Gly Val Thr Thr Val
        115   120   125

Ser Met Thr Thr Asp Ser Ser Tyr Thr Thr Leu Gln Arg Val Ala Ala
    130   135   140

Leu Glu Arg Ser Gly Met Gln Ile Ser Arg His Ser Leu Val Ser Ser
145   150   155   160

Tyr Leu Ala Leu Met Glu Phe Ser Gly Asn Thr Met Thr Arg Asp Ala
            165   170   175

Ser Arg Ala Val Leu Arg Phe Val Thr Val Thr Ala Glu Ala Leu Arg
            180   185   190

Phe Arg Gln Ile Gln Arg Glu Phe Arg Gln Ala Leu Ser Glu Thr Ala
        195   200   205

28

```
Pro Val Tyr Thr Met Thr Pro Gly Asp Val Asp Leu Thr Leu Asn Trp
    210                 215             220

Gly Arg Ile Ser Asn Val Leu Pro Glu Tyr Arg Gly Glu Asp Gly Val
225                 230             235                 240

Arg Val Gly Arg Ile Ser Phe Asn Asn Ile Ser Ala Ile Leu Gly Thr
                245             250                 255

Val Ala Val Ile Leu Asn Cys His His Gln Gly Ala Arg Ser Val Arg
                260             265                 270

Ala Val Asn Glu Glu Ser Gln Pro Glu Cys Gln Ile Thr Gly Asp Arg
        275             280                 285

Pro Val Ile Lys Ile Asn Asn Thr Leu Trp Glu Ser Asn Thr Ala Ala
    290             295                 300

Ala Phe Leu Asn Arg Lys Ser Gln Phe Leu Tyr Thr Thr Gly Lys
305                 310                 315
```

```
<210>  29
<211>  4
<212>  PRT
<213>  Mus musculus

<400>  29

Tyr Gln Thr Ile
1


<210>  30
<211>  31
<212>  DNA
<213>  Unknown

<220>
<223>  Primer

<400>  30
gaattcaagc ttatgatcac tatgcttcaa g                                    31


<210>  31
<211>  29
<212>  DNA
<213>  Unknown
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<220>
<223> Primer

<400> 31
gaattcctgc agtcagacat tattctaac   29

<210> 32
<211> 3938
<212> DNA
<213> Yersinia pseudotuberculosis

<220>
<221> CDS
<222> (474)..(3434)
<223>

 <400> 32
tcatcaaggc aaccatcagg attaatgcgg atattgcgga gtaacacttc agactgaaag   60

tagaaataaa aaccgcagca gacaactgac aacatcaaat gaagggggct tattctaatt   120

gatattattt atatgataat agttcatttt gtatttttgt ttttttgat attctcacct   180

gcttagttac aataaatcaa ttctatcgct gtatggtata gactgtttta ttatatattt   240

tgaatatttt taatctgccc agtctggttt tttaaaaaag tgctatcctc ttaatgtctt   300

tactaaatta gaaaacaagt ttcactttca actattgcat ctttaattaa tggtcaaggt   360

gatttcaaat gctcgtttgt ggccagttat acctcaaata actcaagttg ttgagcacag   420

ccaacgcaca tgcagtttga cgtatgacag gtatgcttta tttcatttaa att atg   476
                                                                   Met
                                                                    1

atg gtt ttc cag cca atc agt gag ttt ctc ttg ata agg aat gcg gga   524
Met Val Phe Gln Pro Ile Ser Glu Phe Leu Leu Ile Arg Asn Ala Gly
             5   10   15

atg tct atg tat ttt aat aaa ata att tca ttt aat att att tca cga   572
Met Ser Met Tyr Phe Asn Lys Ile Ile Ser Phe Asn Ile Ile Ser Arg
          20   25   30

ata gtt att tgt atc ttt ttg ata tgt gga atg ttc atg gct ggg gct   620
Ile Val Ile Cys Ile Phe Leu Ile Cys Gly Met Phe Met Ala Gly Ala
       35   40   45

tca gaa aaa tat gat gct aac gca ccg caa cag gtc cag cct tat tct   668
Ser Glu Lys Tyr Asp Ala Asn Ala Pro Gln Gln Val Gln Pro Tyr Ser
50   55   60   65

gtc tct tca tct gca ttt gaa aat ctc cat cct aat aat gaa atg gag   716
Val Ser Ser Ser Ala Phe Glu Asn Leu His Pro Asn Asn Glu Met Glu
                 70   75   80

30

```
agt tca atc aat ccc ttt tcc gca tcg gat aca gaa aga aat gct gca      764
Ser Ser Ile Asn Pro Phe Ser Ala Ser Asp Thr Glu Arg Asn Ala Ala
            85              90              95

ata ata gat cgc gcc aat aag gag cag gag act gaa gcg gtg aat aag      812
Ile Ile Asp Arg Ala Asn Lys Glu Gln Glu Thr Glu Ala Val Asn Lys
            100             105             110

atg ata agc acc ggg gcc agg tta gct gca tca ggc agg gca tct gat      860
Met Ile Ser Thr Gly Ala Arg Leu Ala Ala Ser Gly Arg Ala Ser Asp
            115             120             125

gtt gct cac tca atg gtg ggc gat gcg gtt aat caa gaa atc aaa cag      908
Val Ala His Ser Met Val Gly Asp Ala Val Asn Gln Glu Ile Lys Gln
130             135             140             145

tgg tta aat cga ttc ggt acg gct caa gtt aat ctg aat ttt gac aaa      956
Trp Leu Asn Arg Phe Gly Thr Ala Gln Val Asn Leu Asn Phe Asp Lys
            150             155             160

aat ttt tcg cta aaa gaa agc tct ctt gat tgg ctg gct cct tgg tat     1004
Asn Phe Ser Leu Lys Glu Ser Ser Leu Asp Trp Leu Ala Pro Trp Tyr
            165             170             175

gac tct gct tca ttc ctc ttt ttt agt cag tta ggt att cgc aat aaa     1052
Asp Ser Ala Ser Phe Leu Phe Phe Ser Gln Leu Gly Ile Arg Asn Lys
            180             185             190

gac agc cgc aac aca ctt aac ctt ggc gtc ggg ata cgt aca ttg gag     1100
Asp Ser Arg Asn Thr Leu Asn Leu Gly Val Gly Ile Arg Thr Leu Glu
            195             200             205

aac ggt tgg ctg tac gga ctt aat act ttt tat gat aat gat ttg acc     1148
Asn Gly Trp Leu Tyr Gly Leu Asn Thr Phe Tyr Asp Asn Asp Leu Thr
210             215             220             225

ggc cac aac cac cgt atc ggt ctt ggt gcc gag gcc tgg acc gat tat     1196
Gly His Asn His Arg Ile Gly Leu Gly Ala Glu Ala Trp Thr Asp Tyr
            230             235             240

tta cag ttg gct gcc aat ggg tat ttt cgc ctc aat gga tgg cac tcg     1244
Leu Gln Leu Ala Ala Asn Gly Tyr Phe Arg Leu Asn Gly Trp His Ser
            245             250             255

tcg cgt gat ttc tcc gac tat aaa gag cgc cca gcc act ggg ggg gat     1292
Ser Arg Asp Phe Ser Asp Tyr Lys Glu Arg Pro Ala Thr Gly Gly Asp
            260             265             270

ttg cgc gcg aat gct tat tta cct gca ctc cca caa ctg ggg ggg aag     1340
Leu Arg Ala Asn Ala Tyr Leu Pro Ala Leu Pro Gln Leu Gly Gly Lys
            275             280             285

ttg atg tat gag caa tac acc ggt gag cgt gtt gct tta ttt ggt aaa     1388
Leu Met Tyr Glu Gln Tyr Thr Gly Glu Arg Val Ala Leu Phe Gly Lys
290             295             300             305
```

31

```
gat aat ctg caa cgc aac cct tat gcc gtg act gcc ggg atc aat tac      1436
Asp Asn Leu Gln Arg Asn Pro Tyr Ala Val Thr Ala Gly Ile Asn Tyr
            310                 315                 320


acc ccc gtg cct cta ctc act gtc ggg gta gat cag cgt atg ggg aaa      1484
Thr Pro Val Pro Leu Leu Thr Val Gly Val Asp Gln Arg Met Gly Lys
            325                 330                 335


agc agt aag cat gaa aca cag tgg aac ctc caa atg aac tat cgc ctg      1532
Ser Ser Lys His Glu Thr Gln Trp Asn Leu Gln Met Asn Tyr Arg Leu
            340                 345                 350


ggc gag agt ttt cag tcg caa ctt agc cct tca gcg gtg gca gga aca      1580
Gly Glu Ser Phe Gln Ser Gln Leu Ser Pro Ser Ala Val Ala Gly Thr
            355                 360                 365


cgt cta ctg gcg gag agc cgc tat aac ctt gtc gat cgt aac aat aat      1628
Arg Leu Leu Ala Glu Ser Arg Tyr Asn Leu Val Asp Arg Asn Asn Asn
370                 375                 380                 385


atc gtg ttg gag tat cag aaa cag cag gtg gtt aaa ctg aca tta tcg      1676
Ile Val Leu Glu Tyr Gln Lys Gln Gln Val Val Lys Leu Thr Leu Ser
                    390                 395                 400


cca gca act atc tcc ggc ctg ccg ggt cag gtt tat cag gtg aac gca      1724
Pro Ala Thr Ile Ser Gly Leu Pro Gly Gln Val Tyr Gln Val Asn Ala
            405                 410                 415


caa gta caa ggg gca tct gct gta agg gaa att gtc tgg agt gat gcc      1772
Gln Val Gln Gly Ala Ser Ala Val Arg Glu Ile Val Trp Ser Asp Ala
            420                 425                 430


gaa ctg att gcc gct ggc ggc aca tta aca cca ctg agt acc aca caa      1820
Glu Leu Ile Ala Ala Gly Gly Thr Leu Thr Pro Leu Ser Thr Thr Gln
            435                 440                 445


ttc aac ttg gtt tta ccg cct tat aaa cgc aca gca caa gtg agt cgg      1868
Phe Asn Leu Val Leu Pro Pro Tyr Lys Arg Thr Ala Gln Val Ser Arg
450                 455                 460                 465


gta acg gac gac ctg aca gcc aac ttt tat tcg ctt agt gcg ctc gcg      1916
Val Thr Asp Asp Leu Thr Ala Asn Phe Tyr Ser Leu Ser Ala Leu Ala
                    470                 475                 480


gtt gat cac caa gga aac cga tct aac tca ttc aca ttg agc gtc acc      1964
Val Asp His Gln Gly Asn Arg Ser Asn Ser Phe Thr Leu Ser Val Thr
                485                 490                 495


gtt cag cag cct cag ttg aca tta acg gcg gcc gtc att ggt gat ggc      2012
Val Gln Gln Pro Gln Leu Thr Leu Thr Ala Ala Val Ile Gly Asp Gly
            500                 505                 510


gca ccg gct aat ggg aaa act gca atc acc gtt gag ttc acc gtt gct      2060
Ala Pro Ala Asn Gly Lys Thr Ala Ile Thr Val Glu Phe Thr Val Ala
            515                 520                 525
```

32

```
gat ttt gag ggg aaa ccc tta gcc ggg cag gag gtg gtg ata acc acc      2108
Asp Phe Glu Gly Lys Pro Leu Ala Gly Gln Glu Val Val Ile Thr Thr
530             535             540                 545

aat aat ggt gcg cta ccg aat aaa atc acg gaa aag aca gat gca aat      2156
Asn Asn Gly Ala Leu Pro Asn Lys Ile Thr Glu Lys Thr Asp Ala Asn
                550             555             560

ggc gtc gcg cgc att gca tta acc aat acg aca gat ggc gtg acg gta      2204
Gly Val Ala Arg Ile Ala Leu Thr Asn Thr Thr Asp Gly Val Thr Val
            565             570             575

gtc aca gca gaa gtg gag ggg caa cgg caa agt gtt gat acc cac ttt      2252
Val Thr Ala Glu Val Glu Gly Gln Arg Gln Ser Val Asp Thr His Phe
            580             585             590

gtt aag ggt act atc gcg gcg gat aaa tcc act ctg gct gcg gta ccg      2300
Val Lys Gly Thr Ile Ala Ala Asp Lys Ser Thr Leu Ala Ala Val Pro
    595             600             605

aca tct atc atc gct gat ggt cta atg gct tca acc atc acg ttg gag      2348
Thr Ser Ile Ile Ala Asp Gly Leu Met Ala Ser Thr Ile Thr Leu Glu
610             615             620             625

ttg aag gat acc tat ggg gac ccg cag gct ggc gcg aat gtg gct ttt      2396
Leu Lys Asp Thr Tyr Gly Asp Pro Gln Ala Gly Ala Asn Val Ala Phe
            630             635             640

gac aca acc tta ggc aat atg ggc gtt atc acg gat cac aat gac ggc      2444
Asp Thr Thr Leu Gly Asn Met Gly Val Ile Thr Asp His Asn Asp Gly
            645             650             655

act tat agc gca cca ttg acc agt acc acg ttg ggg gta gca aca gta      2492
Thr Tyr Ser Ala Pro Leu Thr Ser Thr Thr Leu Gly Val Ala Thr Val
            660             665             670

acg gtg aaa gtg gat ggg gct gcg ttc agt gtg ccg agt gtg acg gtt      2540
Thr Val Lys Val Asp Gly Ala Ala Phe Ser Val Pro Ser Val Thr Val
    675             680             685

aat ttc acg gca gat cct att cca gat gct ggc cgc tcc agt ttc acc      2588
Asn Phe Thr Ala Asp Pro Ile Pro Asp Ala Gly Arg Ser Ser Phe Thr
690             695             700             705

gtc tcc aca ccg gat atc ttg gct gat ggc acg atg agt tcc aca tta      2636
Val Ser Thr Pro Asp Ile Leu Ala Asp Gly Thr Met Ser Ser Thr Leu
            710             715             720

tcc ttt gtc cct gtc gat aag aat ggc cat ttt atc agt ggg atg cag      2684
Ser Phe Val Pro Val Asp Lys Asn Gly His Phe Ile Ser Gly Met Gln
            725             730             735

ggc ttg agt ttt act caa aac ggt gtg ccg gtg agt att agc ccc att      2732
Gly Leu Ser Phe Thr Gln Asn Gly Val Pro Val Ser Ile Ser Pro Ile
        740             745             750
```

33

```
acc gag cag cca gat agc tat acc gcg acg gtg gtt ggg aat agt gtc      2780
Thr Glu Gln Pro Asp Ser Tyr Thr Ala Thr Val Val Gly Asn Ser Val
        755                 760                 765

ggt gat gtc aca atc acg ccg cag gtt gat acc ctg ata ctg agt aca      2828
Gly Asp Val Thr Ile Thr Pro Gln Val Asp Thr Leu Ile Leu Ser Thr
770                 775                 780                 785

ttg cag aaa aaa ata tcc cta ttc ccg gta cct acg ctg acc ggt att      2876
Leu Gln Lys Lys Ile Ser Leu Phe Pro Val Pro Thr Leu Thr Gly Ile
                790                 795                 800

ctg gtt aac ggg caa aat ttc gct acg gat aaa ggg ttc ccg aaa acg      2924
Leu Val Asn Gly Gln Asn Phe Ala Thr Asp Lys Gly Phe Pro Lys Thr
                805                 810                 815

atc ttt aaa aac gcc aca ttc cag tta cag atg gat aac gat gtt gct      2972
Ile Phe Lys Asn Ala Thr Phe Gln Leu Gln Met Asp Asn Asp Val Ala
                820                 825                 830

aat aat act cag tat gag tgg tcg tcg tca ttc aca ccc aat gta tcg      3020
Asn Asn Thr Gln Tyr Glu Trp Ser Ser Ser Phe Thr Pro Asn Val Ser
        835                 840                 845

gtt aac gat cag ggt cag gtg acg att acc tac caa acc tat agc gaa      3068
Val Asn Asp Gln Gly Gln Val Thr Ile Thr Tyr Gln Thr Tyr Ser Glu
850                 855                 860                 865

gtg gct gtg acg gcg aaa agt aaa aaa ttc cca agt tat tcg gtg agt      3116
Val Ala Val Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Ser Val Ser
                870                 875                 880

tat cgg ttc tac cca aat cgg tgg ata tac gat ggc ggc aga tcg ctg      3164
Tyr Arg Phe Tyr Pro Asn Arg Trp Ile Tyr Asp Gly Gly Arg Ser Leu
                885                 890                 895

gta tcc agt ctc gag gcc agc aga caa tgc caa ggt tca gat atg tct      3212
Val Ser Ser Leu Glu Ala Ser Arg Gln Cys Gln Gly Ser Asp Met Ser
        900                 905                 910

gcg gtt ctt gaa tcc tca cgt gca acc aac gga acg cgt gcg cct gac      3260
Ala Val Leu Glu Ser Ser Arg Ala Thr Asn Gly Thr Arg Ala Pro Asp
        915                 920                 925

ggg aca ttg tgg ggc gag tgg ggg agc ttg acc gcg tat agt tct gat      3308
Gly Thr Leu Trp Gly Glu Trp Gly Ser Leu Thr Ala Tyr Ser Ser Asp
930                 935                 940                 945

tgg caa tct ggt gaa tat tgg gtc aaa aag acc agc acg gat ttt gaa      3356
Trp Gln Ser Gly Glu Tyr Trp Val Lys Lys Thr Ser Thr Asp Phe Glu
                950                 955                 960

acc atg aat atg gac aca ggc gca ctg caa cca ggg cct gca tac ttg      3404
Thr Met Asn Met Asp Thr Gly Ala Leu Gln Pro Gly Pro Ala Tyr Leu
        965                 970                 975
```

34

```
gcg ttc ccg ctc tgt gcg ctg tca ata taa ccagataaca gatagcaata      3454
Ala Phe Pro Leu Cys Ala Leu Ser Ile
        980             985
```

```
agaacagttt aatgagctga ttatttgggg cgcgaatggg agtccggcaa tcctagactc   3514
```

```
gccccataag tagcaaacgt ccagaagaac aacgccgctc aggttaattg agcggcgctg   3574
```

```
ttttttttaaa aggattgtcg cgattaaatg ccgatcttac ggcccaggat attggcacct  3634
```

```
ttagcctgac catcagggcc atagagcgat tggccgtggc gggtattcag gactgccaat   3694
```

```
gcttgattat tatgttcaat atgttgttgt aacagtaacc cattgtgcag gttgctgtaa   3754
```

```
cgcaggcgct cagtgagttg caaaagacgc tgccaacgtt cagctaaagc ctgcatgtgg   3814
```

```
ggataaggcg cttgaatatt cgcggtggtc tcggtggtta tccgggtctg atccaaatag   3874
```

```
gccaaggttg ccaatattga actttttttgt tccgttaccc cttgcaatac ccagccttgg  3934
```

```
atcc                                                               3938
```

<210> 33
<211> 986
<212> PRT
<213> Yersinia pseudotuberculosis

<400> 33

```
Met Met Val Phe Gln Pro Ile Ser Glu Phe Leu Leu Ile Arg Asn Ala
1               5                   10                  15
```

```
Gly Met Ser Met Tyr Phe Asn Lys Ile Ile Ser Phe Asn Ile Ile Ser
            20                  25                  30
```

```
Arg Ile Val Ile Cys Ile Phe Leu Ile Cys Gly Met Phe Met Ala Gly
        35                  40                  45
```

```
Ala Ser Glu Lys Tyr Asp Ala Asn Ala Pro Gln Gln Val Gln Pro Tyr
    50                  55                  60
```

```
Ser Val Ser Ser Ser Ala Phe Glu Asn Leu His Pro Asn Asn Glu Met
65                  70                  75                  80
```

```
Glu Ser Ser Ile Asn Pro Phe Ser Ala Ser Asp Thr Glu Arg Asn Ala
                85                  90                  95
```

35

```
Ala Ile Ile Asp Arg Ala Asn Lys Glu Gln Glu Thr Glu Ala Val Asn
            100             105             110

Lys Met Ile Ser Thr Gly Ala Arg Leu Ala Ala Ser Gly Arg Ala Ser
            115             120             125

Asp Val Ala His Ser Met Val Gly Asp Ala Val Asn Gln Glu Ile Lys
        130             135             140

Gln Trp Leu Asn Arg Phe Gly Thr Ala Gln Val Asn Leu Asn Phe Asp
145             150             155             160

Lys Asn Phe Ser Leu Lys Glu Ser Ser Leu Asp Trp Leu Ala Pro Trp
            165             170             175

Tyr Asp Ser Ala Ser Phe Leu Phe Phe Ser Gln Leu Gly Ile Arg Asn
            180             185             190

Lys Asp Ser Arg Asn Thr Leu Asn Leu Gly Val Gly Ile Arg Thr Leu
            195             200             205

Glu Asn Gly Trp Leu Tyr Gly Leu Asn Thr Phe Tyr Asp Asn Asp Leu
    210             215             220

Thr Gly His Asn His Arg Ile Gly Leu Gly Ala Glu Ala Trp Thr Asp
225             230             235             240

Tyr Leu Gln Leu Ala Ala Asn Gly Tyr Phe Arg Leu Asn Gly Trp His
            245             250             255

Ser Ser Arg Asp Phe Ser Asp Tyr Lys Glu Arg Pro Ala Thr Gly Gly
            260             265             270

Asp Leu Arg Ala Asn Ala Tyr Leu Pro Ala Leu Pro Gln Leu Gly Gly
            275             280             285

Lys Leu Met Tyr Glu Gln Tyr Thr Gly Glu Arg Val Ala Leu Phe Gly
            290             295             300

Lys Asp Asn Leu Gln Arg Asn Pro Tyr Ala Val Thr Ala Gly Ile Asn
305             310             315             320
```

36

Tyr Thr Pro Val Pro Leu Leu Thr Val Gly Val Asp Gln Arg Met Gly
            325   330   335

Lys Ser Ser Lys His Glu Thr Gln Trp Asn Leu Gln Met Asn Tyr Arg
          340   345   350

Leu Gly Glu Ser Phe Gln Ser Gln Leu Ser Pro Ser Ala Val Ala Gly
          355   360   365

Thr Arg Leu Leu Ala Glu Ser Arg Tyr Asn Leu Val Asp Arg Asn Asn
          370   375   380

Asn Ile Val Leu Glu Tyr Gln Lys Gln Gln Val Val Lys Leu Thr Leu
385   390   395   400

Ser Pro Ala Thr Ile Ser Gly Leu Pro Gly Gln Val Tyr Gln Val Asn
             405   410   415

Ala Gln Val Gln Gly Ala Ser Ala Val Arg Glu Ile Val Trp Ser Asp
           420   425   430

Ala Glu Leu Ile Ala Ala Gly Gly Thr Leu Thr Pro Leu Ser Thr Thr
          435   440   445

Gln Phe Asn Leu Val Leu Pro Pro Tyr Lys Arg Thr Ala Gln Val Ser
       450   455   460

Arg Val Thr Asp Asp Leu Thr Ala Asn Phe Tyr Ser Leu Ser Ala Leu
465   470   475   480

Ala Val Asp His Gln Gly Asn Arg Ser Asn Ser Phe Thr Leu Ser Val
           485   490   495

Thr Val Gln Gln Pro Gln Leu Thr Leu Thr Ala Ala Val Ile Gly Asp
          500   505   510

Gly Ala Pro Ala Asn Gly Lys Thr Ala Ile Thr Val Glu Phe Thr Val
          515   520   525

Ala Asp Phe Glu Gly Lys Pro Leu Ala Gly Gln Glu Val Val Ile Thr
          530   535   540

```
Thr Asn Asn Gly Ala Leu Pro Asn Lys Ile Thr Glu Lys Thr Asp Ala
545                 550             555                 560


Asn Gly Val Ala Arg Ile Ala Leu Thr Asn Thr Thr Asp Gly Val Thr
                565             570                 575


Val Val Thr Ala Glu Val Glu Gly Gln Arg Gln Ser Val Asp Thr His
            580             585                 590


Phe Val Lys Gly Thr Ile Ala Ala Asp Lys Ser Thr Leu Ala Ala Val
        595             600             605


Pro Thr Ser Ile Ile Ala Asp Gly Leu Met Ala Ser Thr Ile Thr Leu
    610             615             620


Glu Leu Lys Asp Thr Tyr Gly Asp Pro Gln Ala Gly Ala Asn Val Ala
625                 630             635                 640


Phe Asp Thr Thr Leu Gly Asn Met Gly Val Ile Thr Asp His Asn Asp
                645             650             655


Gly Thr Tyr Ser Ala Pro Leu Thr Ser Thr Thr Leu Gly Val Ala Thr
            660             665                 670


Val Thr Val Lys Val Asp Gly Ala Ala Phe Ser Val Pro Ser Val Thr
        675             680             685


Val Asn Phe Thr Ala Asp Pro Ile Pro Asp Ala Gly Arg Ser Ser Phe
    690             695             700


Thr Val Ser Thr Pro Asp Ile Leu Ala Asp Gly Thr Met Ser Ser Thr
705                 710             715                 720


Leu Ser Phe Val Pro Val Asp Lys Asn Gly His Phe Ile Ser Gly Met
                725             730                 735


Gln Gly Leu Ser Phe Thr Gln Asn Gly Val Pro Val Ser Ile Ser Pro
            740             745                 750


Ile Thr Glu Gln Pro Asp Ser Tyr Thr Ala Thr Val Val Gly Asn Ser
    755             760                 765
```

38

Val Gly Asp Val Thr Ile Thr Pro Gln Val Asp Thr Leu Ile Leu Ser
    770   775   780

Thr Leu Gln Lys Lys Ile Ser Leu Phe Pro Val Pro Thr Leu Thr Gly
785   790   795   800

Ile Leu Val Asn Gly Gln Asn Phe Ala Thr Asp Lys Gly Phe Pro Lys
                805   810   815

Thr Ile Phe Lys Asn Ala Thr Phe Gln Leu Gln Met Asp Asn Asp Val
             820   825   830

Ala Asn Asn Thr Gln Tyr Glu Trp Ser Ser Ser Phe Thr Pro Asn Val
        835   840   845

Ser Val Asn Asp Gln Gly Gln Val Thr Ile Thr Tyr Gln Thr Tyr Ser
    850   855   860

Glu Val Ala Val Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Ser Val
865   870   875   880

Ser Tyr Arg Phe Tyr Pro Asn Arg Trp Ile Tyr Asp Gly Gly Arg Ser
             885   890   895

Leu Val Ser Ser Leu Glu Ala Ser Arg Gln Cys Gln Gly Ser Asp Met
             900   905   910

Ser Ala Val Leu Glu Ser Ser Arg Ala Thr Asn Gly Thr Arg Ala Pro
        915   920   925

Asp Gly Thr Leu Trp Gly Glu Trp Gly Ser Leu Thr Ala Tyr Ser Ser
    930   935   940

Asp Trp Gln Ser Gly Glu Tyr Trp Val Lys Lys Thr Ser Thr Asp Phe
945   950   955   960

Glu Thr Met Asn Met Asp Thr Gly Ala Leu Gln Pro Gly Pro Ala Tyr
                965   970   975

Leu Ala Phe Pro Leu Cys Ala Leu Ser Ile
        980   985

39

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<210>  34
<211>  9
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic Sequence

<220>
<221>  MISC_FEATURE
<222>  (2)..(2)
<223>  Xaa is a variable amino acid

<220>
<221>  MISC_FEATURE
<222>  (5)..(5)
<223>  Xaa is a variable amino acid

<220>
<221>  MISC_FEATURE
<222>  (9)..(9)
<223>  Xaa is a variable amino acid

<400>  34

Leu Xaa Gly Gly Xaa Gly Asn Asp Xaa
1               5


<210>  35
<211>  830
<212>  DNA
<213>  Neisseria meningitidis

<220>
<221>  CDS
<222>  (143)..(667)
<223>

 <400>  35
tcggcaaagc agccggatac cgctacgtat cttgaagtat tgaaaatatt acgatgcaaa      60

aaagaaaatt taagtataat acagcaggat tctttaacgg attcttaaca attttttctaa    120

ctgaccataa aggaaccaaa at atg aaa aaa gca ctt gcc aca ctg att gcc      172
                          Met Lys Lys Ala Leu Ala Thr Leu Ile Ala
                          1               5                   10

ctc gct ctc ccg gcc gcc gca ctg gcg gaa ggc gca tcc ggc ttt tac      220
Leu Ala Leu Pro Ala Ala Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr
              15                  20                  25

gtc caa gcc gat gcc gca cac gca aaa gcc tca agc tct tta ggt tct      268
Val Gln Ala Asp Ala Ala His Ala Lys Ala Ser Ser Ser Leu Gly Ser
              30                  35                  40
```

40

```
gcc aaa ggc ttc agc ccg cgc atc tcc gca ggc tac cgc atc aac gac      316
Ala Lys Gly Phe Ser Pro Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp
        45                  50                  55

ctc cgc ttc gcc gtc gat tac acg cgc tac aaa aac tat aaa gcc cca      364
Leu Arg Phe Ala Val Asp Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro
    60                  65                  70

tcc acc gat ttc aaa ctt tac agc atc ggc gcg tcc gcc att tac gac      412
Ser Thr Asp Phe Lys Leu Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp
75                  80                  85                  90

ttc gac acc caa tcg ccc gtc aaa ccg tat ctc ggc gcg cgc ttg agc      460
Phe Asp Thr Gln Ser Pro Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser
                95                  100                 105

ctc aac cgc gcc tcc gtc gac ttg ggc ggc agc gac agc ttc agc caa      508
Leu Asn Arg Ala Ser Val Asp Leu Gly Gly Ser Asp Ser Phe Ser Gln
            110                 115                 120

acc tcc atc ggc ctc ggc gta ttg acg ggc gta agc tat gcc gtt acc      556
Thr Ser Ile Gly Leu Gly Val Leu Thr Gly Val Ser Tyr Ala Val Thr
            125                 130                 135

ccg aat gtc gat ttg gat gcc ggc tac cgc tac aac tac atc ggc aaa      604
Pro Asn Val Asp Leu Asp Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys
    140                 145                 150

gtc aac act gtc aaa aac gtc cgt tcc ggc gaa ctg tcc gtc ggc gtg      652
Val Asn Thr Val Lys Asn Val Arg Ser Gly Glu Leu Ser Val Gly Val
155                 160                 165                 170

cgc gtc aaa ttc tga tatgcgcctt attctgcaaa ccgccgagcc ttcggcggtt      707
Arg Val Lys Phe


ttgttttctg ccaccgcaac tacacaagcc ggcggttttg tacgataatc ccgaatgctg      767

cggcttctgc cgccctattt tttgaggaat ccgaaatgtc caaaaccatc atccacaccg      827

aca                                                                     830
```

```
<210>  36
<211>  174
<212>  PRT
<213>  Neisseria meningitidis

<400>  36

Met Lys Lys Ala Leu Ala Thr Leu Ile Ala Leu Ala Leu Pro Ala Ala
1               5                   10                  15
```

41

Ala Leu Ala Glu Gly Ala Ser Gly Phe Tyr Val Gln Ala Asp Ala Ala
            20   25   30

His Ala Lys Ala Ser Ser Ser Leu Gly Ser Ala Lys Gly Phe Ser Pro
            35   40   45

Arg Ile Ser Ala Gly Tyr Arg Ile Asn Asp Leu Arg Phe Ala Val Asp
        50   55   60

Tyr Thr Arg Tyr Lys Asn Tyr Lys Ala Pro Ser Thr Asp Phe Lys Leu
65   70   75   80

Tyr Ser Ile Gly Ala Ser Ala Ile Tyr Asp Phe Asp Thr Gln Ser Pro
            85   90   95

Val Lys Pro Tyr Leu Gly Ala Arg Leu Ser Leu Asn Arg Ala Ser Val
            100   105   110

Asp Leu Gly Gly Ser Asp Ser Phe Ser Gln Thr Ser Ile Gly Leu Gly
            115   120   125

Val Leu Thr Gly Val Ser Tyr Ala Val Thr Pro Asn Val Asp Leu Asp
            130   135   140

Ala Gly Tyr Arg Tyr Asn Tyr Ile Gly Lys Val Asn Thr Val Lys Asn
145   150   155   160

Val Arg Ser Gly Glu Leu Ser Val Gly Val Arg Val Lys Phe
                165   170

<210> 37 <211> 352 <212> PRT <213> Homo sapiens <400> 37

Met Glu Gly Ile Ser Ile Tyr Thr Ser Asp Asn Tyr Thr Glu Glu Met
1   5   10   15

Gly Ser Gly Asp Tyr Asp Ser Met Lys Glu Pro Cys Phe Arg Glu Glu
            20   25   30

Asn Ala Asn Phe Asn Lys Ile Phe Leu Pro Thr Ile Tyr Ser Ile Ile
            35   40   45

42

```
Phe Leu Thr Gly Ile Val Gly Asn Gly Leu Val Ile Leu Val Met Gly
    50              55              60

Tyr Gln Lys Lys Leu Arg Ser Met Thr Asp Lys Tyr Arg Leu His Leu
65              70              75              80

Ser Val Ala Asp Leu Leu Phe Val Ile Thr Leu Pro Phe Trp Ala Val
            85              90              95

Asp Ala Val Ala Asn Trp Tyr Phe Gly Asn Phe Leu Cys Lys Ala Val
            100             105             110

His Val Ile Tyr Thr Val Asn Leu Tyr Ser Ser Val Leu Ile Leu Ala
        115             120             125

Phe Ile Ser Leu Asp Arg Tyr Leu Ala Ile Val His Ala Thr Asn Ser
    130             135             140

Gln Arg Pro Arg Lys Leu Leu Ala Glu Lys Val Val Tyr Val Gly Val
145             150             155             160

Trp Ile Pro Ala Leu Leu Leu Thr Ile Pro Asp Phe Ile Phe Ala Asn
            165             170             175

Val Ser Glu Ala Asp Asp Arg Tyr Ile Cys Asp Arg Phe Tyr Pro Asn
            180             185             190

Asp Leu Trp Val Val Val Phe Gln Phe Gln His Ile Met Val Gly Leu
        195             200             205

Ile Leu Pro Gly Ile Val Ile Leu Ser Cys Tyr Cys Ile Ile Ile Ser
    210             215             220

Lys Leu Ser His Ser Lys Gly His Gln Lys Arg Lys Ala Leu Lys Thr
225             230             235             240

Thr Ile Ile Pro Ile Leu Ala Phe Phe Ala Cys Trp Leu Pro Tyr Tyr
            245             250             255

Ile Gly Ile Ser Ile Asp Ser Phe Ile Leu Leu Glu Ile Ile Lys Gln
            260             265             270
```

43

```
Gly Cys Glu Phe Glu Asn Thr Val His Lys Trp Ile Ser Ile Thr Glu
        275                 280                 285


Ala Leu Ala Phe Phe His Cys Cys Leu Asn Pro Ile Leu Tyr Ala Phe
        290                 295                 300


Leu Gly Ala Lys Phe Lys Thr Ser Ala Gln His Ala Leu Thr Ser Val
305                 310                 315                 320


Ser Arg Gly Ser Ser Leu Lys Ile Leu Ser Lys Gly Lys Arg Gly Gly
                325                 330                 335


His Ser Ser Val Ser Thr Glu Ser Glu Ser Ser Ser Phe His Ser Ser
                340                 345                 350
```

```
<210>  38
<211>  645
<212>  DNA
<213>  Homo sapiens

<220>
<221>  CDS
<222>  (10)..(639)
<223>

<400>  38
cttgcaggg atg ctg cgc gcg gga gaa gtc cac acc ggg acc acc atc atg      51
          Met Leu Arg Ala Gly Glu Val His Thr Gly Thr Thr Ile Met
          1               5                   10


gca gtg gag ttt gac ggg ggc gtt gtg atg ggt tct gat tcc cga gtg      99
Ala Val Glu Phe Asp Gly Gly Val Val Met Gly Ser Asp Ser Arg Val
15                  20                  25                  30


tct gca ggc gag gcg gtg gtg aac cga gtg ttt gac aag ctg tcc ccg     147
Ser Ala Gly Glu Ala Val Val Asn Arg Val Phe Asp Lys Leu Ser Pro
                35                  40                  45


ctg cac gag cgc atc tac tgt gca ctc tct ggt tca gct gct gat gcc     195
Leu His Glu Arg Ile Tyr Cys Ala Leu Ser Gly Ser Ala Ala Asp Ala
                50                  55                  60


caa gcc gtg gcc gac atg gcc gcc tac cag ctg gag ctc cat ggg ata     243
Gln Ala Val Ala Asp Met Ala Ala Tyr Gln Leu Glu Leu His Gly Ile
                65                  70                  75


gaa ctg gag gaa cct cca ctt gtt ttg gct gct gca aat gtg gtg aga     291
Glu Leu Glu Glu Pro Pro Leu Val Leu Ala Ala Ala Asn Val Val Arg
        80                  85                  90
```

44

```
aat atc agc tat aaa tat cga gag gac ttg tct gca cat ctc atg gta        339
Asn Ile Ser Tyr Lys Tyr Arg Glu Asp Leu Ser Ala His Leu Met Val
95              100             105             110

gct ggc tgg gac caa cgt gaa gga ggt cag gta tat gga acc ctg gga        387
Ala Gly Trp Asp Gln Arg Glu Gly Gly Gln Val Tyr Gly Thr Leu Gly
                115             120             125

gga atg ctg act cga cag cct ttt gcc att ggt ggc tcc ggc agc acc        435
Gly Met Leu Thr Arg Gln Pro Phe Ala Ile Gly Gly Ser Gly Ser Thr
                130             135             140

ttt atc tat ggt tat gtg gat gca gca tat aag cca ggc atg tct ccc        483
Phe Ile Tyr Gly Tyr Val Asp Ala Ala Tyr Lys Pro Gly Met Ser Pro
        145             150             155

gag gag tgc agg cgc ttc acc aca gac gct att gct ctg gcc atg agc        531
Glu Glu Cys Arg Arg Phe Thr Thr Asp Ala Ile Ala Leu Ala Met Ser
    160             165             170

cgg gat ggc tca agc ggg ggt gtc atc tac ctg gtc act att aca gct        579
Arg Asp Gly Ser Ser Gly Gly Val Ile Tyr Leu Val Thr Ile Thr Ala
175             180             185             190

gcc ggt gtg gac cat cga gtc atc ttg ggc aat gaa ctg cca aaa ttc        627
Ala Gly Val Asp His Arg Val Ile Leu Gly Asn Glu Leu Pro Lys Phe
                195             200             205

tat gat gag tga accttc                                                 645
Tyr Asp Glu
```

<210> 39
<211> 209
<212> PRT
<213> Homo sapiens

<400> 39

```
Met Leu Arg Ala Gly Glu Val His Thr Gly Thr Thr Ile Met Ala Val
1           5               10              15

Glu Phe Asp Gly Gly Val Val Met Gly Ser Asp Ser Arg Val Ser Ala
            20              25              30

Gly Glu Ala Val Val Asn Arg Val Phe Asp Lys Leu Ser Pro Leu His
        35              40              45

Glu Arg Ile Tyr Cys Ala Leu Ser Gly Ser Ala Ala Asp Ala Gln Ala
    50              55              60
```

45

```
Val Ala Asp Met Ala Ala Tyr Gln Leu Glu Leu His Gly Ile Glu Leu
65              70              75                  80


Glu Glu Pro Pro Leu Val Leu Ala Ala Ala Asn Val Val Arg Asn Ile
            85              90                  95


Ser Tyr Lys Tyr Arg Glu Asp Leu Ser Ala His Leu Met Val Ala Gly
            100             105             110


Trp Asp Gln Arg Glu Gly Gly Gln Val Tyr Gly Thr Leu Gly Gly Met
        115             120             125


Leu Thr Arg Gln Pro Phe Ala Ile Gly Gly Ser Gly Ser Thr Phe Ile
    130             135             140


Tyr Gly Tyr Val Asp Ala Ala Tyr Lys Pro Gly Met Ser Pro Glu Glu
145             150             155             160


Cys Arg Arg Phe Thr Thr Asp Ala Ile Ala Leu Ala Met Ser Arg Asp
            165             170             175


Gly Ser Ser Gly Gly Val Ile Tyr Leu Val Thr Ile Thr Ala Ala Gly
        180             185             190


Val Asp His Arg Val Ile Leu Gly Asn Glu Leu Pro Lys Phe Tyr Asp
        195             200             205


Glu
```

```
<210>  40
<211>  2247
<212>  DNA
<213>  Homo sapiens

<220>
<221>  CDS
<222>  (1)..(2247)
<223>

<400>  40
atg gct agc tct agg tgt ccc gct ccc cgc ggg tgc cgc tgc ctc ccc      48
Met Ala Ser Ser Arg Cys Pro Ala Pro Arg Gly Cys Arg Cys Leu Pro
1               5               10              15
```

```
gga gct tct ctc gca tgg ctg ggg aca gta ctg cta ctt ctc gcc gac     96
Gly Ala Ser Leu Ala Trp Leu Gly Thr Val Leu Leu Leu Leu Ala Asp
            20              25              30

tgg gtg ctg ctc cgg acc gcg ctg ccc cgc ata ttc tcc ctg ctg gtg    144
Trp Val Leu Leu Arg Thr Ala Leu Pro Arg Ile Phe Ser Leu Leu Val
            35              40              45

ccc acc gcg ctg cca ctg ctc cgg gtc tgg gcg gtg ggc ctg agc cgc    192
Pro Thr Ala Leu Pro Leu Leu Arg Val Trp Ala Val Gly Leu Ser Arg
            50              55              60

tgg gcc gtg ctc tgg ctg ggg gcc tgc ggg gtc ctc agg gca acg gtt    240
Trp Ala Val Leu Trp Leu Gly Ala Cys Gly Val Leu Arg Ala Thr Val
65              70              75              80

ggc tcc aag agc gaa aac gca ggt gcc cag ggc tgg ctg gct gct ttg    288
Gly Ser Lys Ser Glu Asn Ala Gly Ala Gln Gly Trp Leu Ala Ala Leu
            85              90              95

aag cca tta gct gcg gca ctg ggc ttg gcc ctg ccg gga ctt gcc ttg    336
Lys Pro Leu Ala Ala Ala Leu Gly Leu Ala Leu Pro Gly Leu Ala Leu
            100             105             110

ttc cga gag ctg atc tca tgg gga gcc ccc ggg tcc gcg gat agc acc    384
Phe Arg Glu Leu Ile Ser Trp Gly Ala Pro Gly Ser Ala Asp Ser Thr
            115             120             125

agg cta ctg cac tgg gga agt cac cct acc gcc ttc gtt gtc agt tat    432
Arg Leu Leu His Trp Gly Ser His Pro Thr Ala Phe Val Val Ser Tyr
            130             135             140

gca gcg gca ctg ccc gca gca gcc ctg tgg cac aaa ctc ggg agc ctc    480
Ala Ala Ala Leu Pro Ala Ala Ala Leu Trp His Lys Leu Gly Ser Leu
145             150             155             160

tgg gtg ccc ggc ggt cag ggc ggc tct gga aac cct gtg cgt cgg ctt    528
Trp Val Pro Gly Gly Gln Gly Gly Ser Gly Asn Pro Val Arg Arg Leu
            165             170             175

cta ggc tgc ctg ggc tcg gag acg cgc cgc ctc tcg ctg ttc ctg gtc    576
Leu Gly Cys Leu Gly Ser Glu Thr Arg Arg Leu Ser Leu Phe Leu Val
            180             185             190

ctg gtg gtc ctc tcc tct ctt ggg gag atg gcc att cca ttc ttt acg    624
Leu Val Val Leu Ser Ser Leu Gly Glu Met Ala Ile Pro Phe Phe Thr
            195             200             205

ggc cgc ctc act gac tgg att cta caa gat ggc tca gcc gat acc ttc    672
Gly Arg Leu Thr Asp Trp Ile Leu Gln Asp Gly Ser Ala Asp Thr Phe
            210             215             220

act cga aac tta act ctc atg tcc att ctc acc ata gcc agt gca gtg    720
Thr Arg Asn Leu Thr Leu Met Ser Ile Leu Thr Ile Ala Ser Ala Val
225             230             235             240
```

47

```
ctg gag ttc gtg ggt gac ggg atc tat aac aac acc atg ggc cac gtg     768
Leu Glu Phe Val Gly Asp Gly Ile Tyr Asn Asn Thr Met Gly His Val
            245             250             255

cac agc cac ttg cag gga gag gtg ttt ggg gct gtc ctg cgc cag gag     816
His Ser His Leu Gln Gly Glu Val Phe Gly Ala Val Leu Arg Gln Glu
            260             265             270

acg gag ttt ttc caa cag aac cag aca ggt aac atc atg tct cgg gta     864
Thr Glu Phe Phe Gln Gln Asn Gln Thr Gly Asn Ile Met Ser Arg Val
            275             280             285

aca gag gac acg tcc acc ctg agt gat tct ctg agt gag aat ctg agc     912
Thr Glu Asp Thr Ser Thr Leu Ser Asp Ser Leu Ser Glu Asn Leu Ser
    290             295             300

tta ttt ctg tgg tac ctg gtg cga ggc cta tgt ctc ttg ggg atc atg     960
Leu Phe Leu Trp Tyr Leu Val Arg Gly Leu Cys Leu Leu Gly Ile Met
305             310             315             320

ctc tgg gga tca gtg tcc ctc acc atg gtc acc ctg gtc acc ctg cct    1008
Leu Trp Gly Ser Val Ser Leu Thr Met Val Thr Leu Val Thr Leu Pro
                325             330             335

ctg ctt ttc ctt ctg ccc aag aag gtg gga aaa tgg tac cag ttg ctg    1056
Leu Leu Phe Leu Leu Pro Lys Lys Val Gly Lys Trp Tyr Gln Leu Leu
            340             345             350

gaa gtg cag gtg cgg gaa tct ctg gca aag tcc agc cag gtg gcc att    1104
Glu Val Gln Val Arg Glu Ser Leu Ala Lys Ser Ser Gln Val Ala Ile
            355             360             365

gag gct ctg tcg gcc atg cct aca gtt cga agc ttt gcc aac gag gag    1152
Glu Ala Leu Ser Ala Met Pro Thr Val Arg Ser Phe Ala Asn Glu Glu
    370             375             380

ggc gaa gcc cag aag ttt agg gaa aag ctg caa gaa ata aag aca ctc    1200
Gly Glu Ala Gln Lys Phe Arg Glu Lys Leu Gln Glu Ile Lys Thr Leu
385             390             395             400

aac cag aag gag gct gtg gcc tat gca gtc aac tcc tgg acc act agt    1248
Asn Gln Lys Glu Ala Val Ala Tyr Ala Val Asn Ser Trp Thr Thr Ser
                405             410             415

att tca ggt atg ctg ctg aaa gtg gga atc ctc tac att ggt ggg cag    1296
Ile Ser Gly Met Leu Leu Lys Val Gly Ile Leu Tyr Ile Gly Gly Gln
            420             425             430

ctg gtg acc agt ggg gct gta agc agt ggg aac ctt gtc aca ttt gtt    1344
Leu Val Thr Ser Gly Ala Val Ser Ser Gly Asn Leu Val Thr Phe Val
            435             440             445

ctc tac cag atg cag ttc acc cag gct ttg gag gta ctg ctc tcc atc    1392
Leu Tyr Gln Met Gln Phe Thr Gln Ala Leu Glu Val Leu Leu Ser Ile
    450             455             460
```

48

```
tac ccc aga gta cag aag gct gtg ggc tcc tca gag aaa ata ttt gag      1440
Tyr Pro Arg Val Gln Lys Ala Val Gly Ser Ser Glu Lys Ile Phe Glu
465             470             475             480

tac ctg gac cgc acc cct cgc tgc cca ccc agt ggt ctg ttg act ccc      1488
Tyr Leu Asp Arg Thr Pro Arg Cys Pro Pro Ser Gly Leu Leu Thr Pro
                485             490             495

tta cac ttg gag ggc ctt gtc cag ttc caa gat gtc tcc ttt gcc tac      1536
Leu His Leu Glu Gly Leu Val Gln Phe Gln Asp Val Ser Phe Ala Tyr
                500             505             510

cca aac cgc cca gat gtc tta gtg cta cag ggg ctg aca ttc acc cta      1584
Pro Asn Arg Pro Asp Val Leu Val Leu Gln Gly Leu Thr Phe Thr Leu
            515             520             525

cgc cct ggc gag gtg acg gcg ctg gtg gga ccc aat ggg tct ggg aag      1632
Arg Pro Gly Glu Val Thr Ala Leu Val Gly Pro Asn Gly Ser Gly Lys
        530             535             540

agc aca gtg gct gcc ctg ctg cag aat ctg tac cag ccc acc ggg gga      1680
Ser Thr Val Ala Ala Leu Leu Gln Asn Leu Tyr Gln Pro Thr Gly Gly
545             550             555             560

cag ctg ctg ttg gat ggg aag ccc ctt ccc caa tat gag cac cgc tac      1728
Gln Leu Leu Leu Asp Gly Lys Pro Leu Pro Gln Tyr Glu His Arg Tyr
                565             570             575

ctg cac agg cag gtg gct gca gtg gga caa gag cca cag gta ttt gga      1776
Leu His Arg Gln Val Ala Ala Val Gly Gln Glu Pro Gln Val Phe Gly
            580             585             590

aga agt ctt caa gaa aat att gcc tat ggc ctg acc cag aag cca act      1824
Arg Ser Leu Gln Glu Asn Ile Ala Tyr Gly Leu Thr Gln Lys Pro Thr
            595             600             605

atg gag gaa atc aca gct gct gca gta aag tct ggg gcc cat agt ttc      1872
Met Glu Glu Ile Thr Ala Ala Ala Val Lys Ser Gly Ala His Ser Phe
        610             615             620

atc tct gga ctc cct cag ggc tat gac aca gag gta ggc gag gct ggg      1920
Ile Ser Gly Leu Pro Gln Gly Tyr Asp Thr Glu Val Gly Glu Ala Gly
625             630             635             640

agc cag ctg tca ggg ggt cag caa cag gca gtg gcg ttg gcc cga gca      1968
Ser Gln Leu Ser Gly Gly Gln Gln Gln Ala Val Ala Leu Ala Arg Ala
                645             650             655

ttg atc cgg aaa ccg tgt gta ctt atc ctg gat gat gcc acc agt gcc      2016
Leu Ile Arg Lys Pro Cys Val Leu Ile Leu Asp Asp Ala Thr Ser Ala
            660             665             670

ctg gat gca aac agc cag tta cag gtg gag cag ctc ctg tac gaa agc      2064
Leu Asp Ala Asn Ser Gln Leu Gln Val Glu Gln Leu Leu Tyr Glu Ser
            675             680             685
```

49

```
cct gag cgg tac tcc cgc tca gtg ctt ctc atc acc cag cac ctc agc      2112
Pro Glu Arg Tyr Ser Arg Ser Val Leu Leu Ile Thr Gln His Leu Ser
    690             695             700

ctg gtg gag cag gct gac cac atc ctc ttt ctg gaa gga ggc gct atc      2160
Leu Val Glu Gln Ala Asp His Ile Leu Phe Leu Glu Gly Gly Ala Ile
705             710             715             720

cgg gag ggg gga acc cac cag cag ctc atg gag aaa aag ggg tgc tac      2208
Arg Glu Gly Gly Thr His Gln Gln Leu Met Glu Lys Lys Gly Cys Tyr
                725             730             735

tgg gcc atg gtg cag gct cct gca gat gct cca gaa tga                  2247
Trp Ala Met Val Gln Ala Pro Ala Asp Ala Pro Glu
            740             745
```

<210> 41
<211> 748
<212> PRT
<213> Homo sapiens

<400> 41

```
Met Ala Ser Ser Arg Cys Pro Ala Pro Arg Gly Cys Arg Cys Leu Pro
1               5               10              15

Gly Ala Ser Leu Ala Trp Leu Gly Thr Val Leu Leu Leu Ala Asp
            20              25              30

Trp Val Leu Leu Arg Thr Ala Leu Pro Arg Ile Phe Ser Leu Leu Val
        35              40              45

Pro Thr Ala Leu Pro Leu Leu Arg Val Trp Ala Val Gly Leu Ser Arg
    50              55              60

Trp Ala Val Leu Trp Leu Gly Ala Cys Gly Val Leu Arg Ala Thr Val
65              70              75              80

Gly Ser Lys Ser Glu Asn Ala Gly Ala Gln Gly Trp Leu Ala Ala Leu
            85              90              95

Lys Pro Leu Ala Ala Ala Leu Gly Leu Ala Leu Pro Gly Leu Ala Leu
            100             105             110

Phe Arg Glu Leu Ile Ser Trp Gly Ala Pro Gly Ser Ala Asp Ser Thr
    115             120             125
```

Arg Leu Leu His Trp Gly Ser His Pro Thr Ala Phe Val Val Ser Tyr
130   135   140

Ala Ala Ala Leu Pro Ala Ala Ala Leu Trp His Lys Leu Gly Ser Leu
145   150   155   160

Trp Val Pro Gly Gly Gln Gly Gly Ser Gly Asn Pro Val Arg Arg Leu
            165   170   175

Leu Gly Cys Leu Gly Ser Glu Thr Arg Arg Leu Ser Leu Phe Leu Val
            180   185   190

Leu Val Val Leu Ser Ser Leu Gly Glu Met Ala Ile Pro Phe Phe Thr
        195   200   205

Gly Arg Leu Thr Asp Trp Ile Leu Gln Asp Gly Ser Ala Asp Thr Phe
    210   215   220

Thr Arg Asn Leu Thr Leu Met Ser Ile Leu Thr Ile Ala Ser Ala Val
225   230   235   240

Leu Glu Phe Val Gly Asp Gly Ile Tyr Asn Asn Thr Met Gly His Val
            245   250   255

His Ser His Leu Gln Gly Glu Val Phe Gly Ala Val Leu Arg Gln Glu
        260   265   270

Thr Glu Phe Phe Gln Gln Asn Gln Thr Gly Asn Ile Met Ser Arg Val
    275   280   285

Thr Glu Asp Thr Ser Thr Leu Ser Asp Ser Leu Ser Glu Asn Leu Ser
    290   295   300

Leu Phe Leu Trp Tyr Leu Val Arg Gly Leu Cys Leu Leu Gly Ile Met
305   310   315   320

Leu Trp Gly Ser Val Ser Leu Thr Met Val Thr Leu Val Thr Leu Pro
            325   330   335

Leu Leu Phe Leu Leu Pro Lys Lys Val Gly Lys Trp Tyr Gln Leu Leu
        340   345   350

Glu Val Gln Val Arg Glu Ser Leu Ala Lys Ser Ser Gln Val Ala Ile
        355   360   365

Glu Ala Leu Ser Ala Met Pro Thr Val Arg Ser Phe Ala Asn Glu Glu
        370   375   380

Gly Glu Ala Gln Lys Phe Arg Glu Lys Leu Gln Glu Ile Lys Thr Leu
385   390   395   400

Asn Gln Lys Glu Ala Val Ala Tyr Ala Val Asn Ser Trp Thr Thr Ser
                405   410   415

Ile Ser Gly Met Leu Leu Lys Val Gly Ile Leu Tyr Ile Gly Gly Gln
            420   425   430

Leu Val Thr Ser Gly Ala Val Ser Ser Gly Asn Leu Val Thr Phe Val
        435   440   445

Leu Tyr Gln Met Gln Phe Thr Gln Ala Leu Glu Val Leu Leu Ser Ile
    450   455   460

Tyr Pro Arg Val Gln Lys Ala Val Gly Ser Ser Glu Lys Ile Phe Glu
465   470   475   480

Tyr Leu Asp Arg Thr Pro Arg Cys Pro Pro Ser Gly Leu Leu Thr Pro
            485   490   495

Leu His Leu Glu Gly Leu Val Gln Phe Gln Asp Val Ser Phe Ala Tyr
        500   505   510

Pro Asn Arg Pro Asp Val Leu Val Leu Gln Gly Leu Thr Phe Thr Leu
    . 515   520   525

Arg Pro Gly Glu Val Thr Ala Leu Val Gly Pro Asn Gly Ser Gly Lys
    530   535   540

Ser Thr Val Ala Ala Leu Leu Gln Asn Leu Tyr Gln Pro Thr Gly Gly
545   550   555   560

Gln Leu Leu Leu Asp Gly Lys Pro Leu Pro Gln Tyr Glu His Arg Tyr
            565   570   575

52

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Leu His Arg Gln Val Ala Ala Val Gly Gln Glu Pro Gln Val Phe Gly
         580             585             590

Arg Ser Leu Gln Glu Asn Ile Ala Tyr Gly Leu Thr Gln Lys Pro Thr
         595             600             605

Met Glu Glu Ile Thr Ala Ala Ala Val Lys Ser Gly Ala His Ser Phe
         610             615             620

Ile Ser Gly Leu Pro Gln Gly Tyr Asp Thr Glu Val Gly Glu Ala Gly
625             630             635             640

Ser Gln Leu Ser Gly Gly Gln Gln Gln Ala Val Ala Leu Ala Arg Ala
         645             650             655

Leu Ile Arg Lys Pro Cys Val Leu Ile Leu Asp Asp Ala Thr Ser Ala
         660             665             670

Leu Asp Ala Asn Ser Gln Leu Gln Val Glu Gln Leu Leu Tyr Glu Ser
         675             680             685

Pro Glu Arg Tyr Ser Arg Ser Val Leu Leu Ile Thr Gln His Leu Ser
         690             695             700

Leu Val Glu Gln Ala Asp His Ile Leu Phe Leu Glu Gly Gly Ala Ile
705             710             715             720

Arg Glu Gly Gly Thr His Gln Gln Leu Met Glu Lys Lys Gly Cys Tyr
         725             730             735

Trp Ala Met Val Gln Ala Pro Ala Asp Ala Pro Glu
         740             745
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<210>  42
<211>  2085
<212>  DNA
<213>  Homo sapiens

<220>
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<222>  (65)..(2005)
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<400> 42

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gtgcagctct tgggtttttt gtggcttcct tcgttattgg agccaggcct acaccccagc        60


aacc atg tcc aag gga cct gca gtt ggt att gat ctt ggc acc acc tac        109
     Met Ser Lys Gly Pro Ala Val Gly Ile Asp Leu Gly Thr Thr Tyr
     1               5                   10                  15


tct tgt gtg ggt gtt ttc cag cac gga aaa gtc gag ata att gcc aat        157
Ser Cys Val Gly Val Phe Gln His Gly Lys Val Glu Ile Ile Ala Asn
                 20                  25                  30


gat cag gga aac cga acc act cca agc tat gtc gcc ttt acg gac act        205
Asp Gln Gly Asn Arg Thr Thr Pro Ser Tyr Val Ala Phe Thr Asp Thr
             35                  40                  45


gaa cgg ttg atc ggt gat gcc gca aag aat caa gtt gca atg aac ccc        253
Glu Arg Leu Ile Gly Asp Ala Ala Lys Asn Gln Val Ala Met Asn Pro
         50                  55                  60


acc aac aca gtt ttt gat gcc aaa cgt ctg att gga cgc aga ttt gat        301
Thr Asn Thr Val Phe Asp Ala Lys Arg Leu Ile Gly Arg Arg Phe Asp
     65                  70                  75


gat gct gtt gtc cag tct gat atg aaa cat tgg ccc ttt atg gtg gtg        349
Asp Ala Val Val Gln Ser Asp Met Lys His Trp Pro Phe Met Val Val
80                  85                  90                  95


aat gat gct ggc agg ccc aag gtc caa gta gaa tac aag gga gag acc        397
Asn Asp Ala Gly Arg Pro Lys Val Gln Val Glu Tyr Lys Gly Glu Thr
                 100                 105                 110


aaa agc ttc tat cca gag gag gtg tct tct atg gtt ctg aca aag atg        445
Lys Ser Phe Tyr Pro Glu Glu Val Ser Ser Met Val Leu Thr Lys Met
             115                 120                 125


aag gaa att gca gaa gcc tac ctt ggg aag act gtt acc aat gct gtg        493
Lys Glu Ile Ala Glu Ala Tyr Leu Gly Lys Thr Val Thr Asn Ala Val
         130                 135                 140


gtc aca gtg cca gct tac ttt aat gac tct cag cgt cag gct acc aaa        541
Val Thr Val Pro Ala Tyr Phe Asn Asp Ser Gln Arg Gln Ala Thr Lys
     145                 150                 155


gat gct gga act att gct ggt ctc aat gta ctt aga att att aat gag        589
Asp Ala Gly Thr Ile Ala Gly Leu Asn Val Leu Arg Ile Ile Asn Glu
160                 165                 170                 175


cca act gct gct gct att gct tac ggc tta gac aaa aag gtt gga gca        637
Pro Thr Ala Ala Ala Ile Ala Tyr Gly Leu Asp Lys Lys Val Gly Ala
                 180                 185                 190


gaa aga aac gtg ctc atc ttt gac ctg gga ggt ggc act ttt gat gtg        685
Glu Arg Asn Val Leu Ile Phe Asp Leu Gly Gly Gly Thr Phe Asp Val
                 195                 200                 205
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·54

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tca atc ctc act att gag gat gga atc ttt gag gtc aag tct aca gct      733
Ser Ile Leu Thr Ile Glu Asp Gly Ile Phe Glu Val Lys Ser Thr Ala
        210                 215                 220

gga gac acc cac ttg ggt gga gaa gat ttt gac aac cga atg gtc aac      781
Gly Asp Thr His Leu Gly Gly Glu Asp Phe Asp Asn Arg Met Val Asn
        225                 230                 235

cat ttt att gct gag ttt aag cgc aag cat aag aag gac atc agt gag      829
His Phe Ile Ala Glu Phe Lys Arg Lys His Lys Lys Asp Ile Ser Glu
240                 245                 250                 255

aac aag aga gct gta aga cgc ctc cgt act gct tgt gaa cgt gct aag      877
Asn Lys Arg Ala Val Arg Arg Leu Arg Thr Ala Cys Glu Arg Ala Lys
                260                 265                 270

cgt acc ctc tct tcc agc acc cag gcc agt att gag atc gat tct ctc      925
Arg Thr Leu Ser Ser Ser Thr Gln Ala Ser Ile Glu Ile Asp Ser Leu
                275                 280                 285

tat gaa gga atc gac ttc tat acc tcc att acc cgt gcc cga ttt gaa      973
Tyr Glu Gly Ile Asp Phe Tyr Thr Ser Ile Thr Arg Ala Arg Phe Glu
            290                 295                 300

gaa ctg aat gct gac ctg ttc cgt ggc acc ctg gac cca gta gag aaa     1021
Glu Leu Asn Ala Asp Leu Phe Arg Gly Thr Leu Asp Pro Val Glu Lys
        305                 310                 315

gcc ctt cga gat gcc aaa cta gac aag tca cag att cat gat att gtc     1069
Ala Leu Arg Asp Ala Lys Leu Asp Lys Ser Gln Ile His Asp Ile Val
320                 325                 330                 335

ctg gtt ggt ggt tct act cgt atc ccc aag att cag aag ctt ctc caa     1117
Leu Val Gly Gly Ser Thr Arg Ile Pro Lys Ile Gln Lys Leu Leu Gln
                340                 345                 350

gac ttc ttc aat gga aaa gaa ctg aat aag agc atc aac cct gat gaa     1165
Asp Phe Phe Asn Gly Lys Glu Leu Asn Lys Ser Ile Asn Pro Asp Glu
                355                 360                 365

gct gtt gct tat ggt gca gct gtc cag gca gcc atc ttg tct gga gac     1213
Ala Val Ala Tyr Gly Ala Ala Val Gln Ala Ala Ile Leu Ser Gly Asp
                370                 375                 380

aag tct gag aat gtt caa gat ttg ctg ctc ttg gat gtc act cct ctt     1261
Lys Ser Glu Asn Val Gln Asp Leu Leu Leu Leu Asp Val Thr Pro Leu
        385                 390                 395

tcc ctt ggt att gaa act gct ggt gga gtc atg act gtc ctc atc aag     1309
Ser Leu Gly Ile Glu Thr Ala Gly Gly Val Met Thr Val Leu Ile Lys
400                 405                 410                 415

cgt aat acc acc att cct acc aag cag aca cag acc ttc act acc tat     1357
Arg Asn Thr Thr Ile Pro Thr Lys Gln Thr Gln Thr Phe Thr Thr Tyr
                420                 425                 430
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55

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tct gac aac cag cct ggt gtg ctt att cag gtt tat gaa ggc gag cgt    1405
Ser Asp Asn Gln Pro Gly Val Leu Ile Gln Val Tyr Glu Gly Glu Arg
            435             440             445

gcc atg aca aag gat aac aac ctg ctt ggc aag ttt gaa ctc aca ggc    1453
Ala Met Thr Lys Asp Asn Asn Leu Leu Gly Lys Phe Glu Leu Thr Gly
            450             455             460

ata cct cct gca ccc cga ggt gtt cct cag att gaa gtc act ttt gac    1501
Ile Pro Pro Ala Pro Arg Gly Val Pro Gln Ile Glu Val Thr Phe Asp
            465             470             475

att gat gcc aat ggt ata ctc aat gtc tct gct gtg gac aag agt acg    1549
Ile Asp Ala Asn Gly Ile Leu Asn Val Ser Ala Val Asp Lys Ser Thr
480             485             490             495

gga aaa gag aac aag att act atc act aat gac aag ggc cgt ttg agc    1597
Gly Lys Glu Asn Lys Ile Thr Ile Thr Asn Asp Lys Gly Arg Leu Ser
            500             505             510

aag gaa gac att gaa cgt atg gtc cag gaa gct gag aag tac aaa gct    1645
Lys Glu Asp Ile Glu Arg Met Val Gln Glu Ala Glu Lys Tyr Lys Ala
            515             520             525

gaa gat gag aag cag agg gac aag gtg tca tcc aag aat tca ctt gag    1693
Glu Asp Glu Lys Gln Arg Asp Lys Val Ser Ser Lys Asn Ser Leu Glu
            530             535             540

tcc tat gcc ttc aac atg aaa gca act gtt gaa gat gag aaa ctt caa    1741
Ser Tyr Ala Phe Asn Met Lys Ala Thr Val Glu Asp Glu Lys Leu Gln
            545             550             555

ggc aag att aac gat gag gac aaa cag aag att ctg gac aag tgt aat    1789
Gly Lys Ile Asn Asp Glu Asp Lys Gln Lys Ile Leu Asp Lys Cys Asn
560             565             570             575

gaa att atc aac tgg ctt gat aag aat cag act gct gag aag gaa gaa    1837
Glu Ile Ile Asn Trp Leu Asp Lys Asn Gln Thr Ala Glu Lys Glu Glu
            580             585             590

ttt gaa cat caa cag aaa gag ctg gag aaa gtt tgc aac ccc atc atc    1885
Phe Glu His Gln Gln Lys Glu Leu Glu Lys Val Cys Asn Pro Ile Ile
               595             600             605

acc aag ctg tac cag agt gca gga ggc atg cca gga gga atg cct ggg    1933
Thr Lys Leu Tyr Gln Ser Ala Gly Gly Met Pro Gly Gly Met Pro Gly
            610             615             620

gga ttt cct ggt ggt gga gct cct ccc tct ggt ggt gct tcc tca ggg    1981
Gly Phe Pro Gly Gly Gly Ala Pro Pro Ser Gly Gly Ala Ser Ser Gly
            625             630             635

ccc acc att gaa gag gtt gat taa gccaaccaag tgtagatgta gcattgttcc   2035
Pro Thr Ile Glu Glu Val Asp
640             645
```

56

acacatttaa aacatttgaa ggacctaaat tcgtagcaaa ttctgtggca   2085

<210> 43
<211> 646
<212> PRT
<213> Homo sapiens

<400> 43

Met Ser Lys Gly Pro Ala Val Gly Ile Asp Leu Gly Thr Thr Tyr Ser
1   5   10   15

Cys Val Gly Val Phe Gln His Gly Lys Val Glu Ile Ile Ala Asn Asp
            20   25   30

Gln Gly Asn Arg Thr Thr Pro Ser Tyr Val Ala Phe Thr Asp Thr Glu
        35   40   45

Arg Leu Ile Gly Asp Ala Ala Lys Asn Gln Val Ala Met Asn Pro Thr
    50   55   60

Asn Thr Val Phe Asp Ala Lys Arg Leu Ile Gly Arg Arg Phe Asp Asp
65   70   75   80

Ala Val Val Gln Ser Asp Met Lys His Trp Pro Phe Met Val Val Asn
                85   90   95

Asp Ala Gly Arg Pro Lys Val Gln Val Glu Tyr Lys Gly Glu Thr Lys
            100   105   110

Ser Phe Tyr Pro Glu Glu Val Ser Ser Met Val Leu Thr Lys Met Lys
        115   120   125

Glu Ile Ala Glu Ala Tyr Leu Gly Lys Thr Val Thr Asn Ala Val Val
    130   135   140

Thr Val Pro Ala Tyr Phe Asn Asp Ser Gln Arg Gln Ala Thr Lys Asp
145   150   155   160

Ala Gly Thr Ile Ala Gly Leu Asn Val Leu Arg Ile Ile Asn Glu Pro
            165   170   175

57

```
Thr Ala Ala Ala Ile Ala Tyr Gly Leu Asp Lys Lys Val Gly Ala Glu
        180             185             190

Arg Asn Val Leu Ile Phe Asp Leu Gly Gly Gly Thr Phe Asp Val Ser
        195             200             205

Ile Leu Thr Ile Glu Asp Gly Ile Phe Glu Val Lys Ser Thr Ala Gly
    210             215             220

Asp Thr His Leu Gly Gly Glu Asp Phe Asp Asn Arg Met Val Asn His
225             230             235             240

Phe Ile Ala Glu Phe Lys Arg Lys His Lys Lys Asp Ile Ser Glu Asn
                245             250             255

Lys Arg Ala Val Arg Arg Leu Arg Thr Ala Cys Glu Arg Ala Lys Arg
            260             265             270

Thr Leu Ser Ser Ser Thr Gln Ala Ser Ile Glu Ile Asp Ser Leu Tyr
        275             280             285

Glu Gly Ile Asp Phe Tyr Thr Ser Ile Thr Arg Ala Arg Phe Glu Glu
    290             295             300

Leu Asn Ala Asp Leu Phe Arg Gly Thr Leu Asp Pro Val Glu Lys Ala
305             310             315             320

Leu Arg Asp Ala Lys Leu Asp Lys Ser Gln Ile His Asp Ile Val Leu
            325             330             335

Val Gly Gly Ser Thr Arg Ile Pro Lys Ile Gln Lys Leu Leu Gln Asp
            340             345             350

Phe Phe Asn Gly Lys Glu Leu Asn Lys Ser Ile Asn Pro Asp Glu Ala
        355             360             365

Val Ala Tyr Gly Ala Ala Val Gln Ala Ala Ile Leu Ser Gly Asp Lys
    370             375             380

Ser Glu Asn Val Gln Asp Leu Leu Leu Leu Asp Val Thr Pro Leu Ser
385             390             395             400
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58

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Leu Gly Ile Glu Thr Ala Gly Gly Val Met Thr Val Leu Ile Lys Arg
            405                 410             415

Asn Thr Thr Ile Pro Thr Lys Gln Thr Gln Thr Phe Thr Thr Tyr Ser
            420                 425             430

Asp Asn Gln Pro Gly Val Leu Ile Gln Val Tyr Glu Gly Glu Arg Ala
            435                 440             445

Met Thr Lys Asp Asn Asn Leu Leu Gly Lys Phe Glu Leu Thr Gly Ile
            450                 455             460

Pro Pro Ala Pro Arg Gly Val Pro Gln Ile Glu Val Thr Phe Asp Ile
465                 470             475             480

Asp Ala Asn Gly Ile Leu Asn Val Ser Ala Val Asp Lys Ser Thr Gly
            485                 490             495

Lys Glu Asn Lys Ile Thr Ile Thr Asn Asp Lys Gly Arg Leu Ser Lys
            500                 505             510

Glu Asp Ile Glu Arg Met Val Gln Glu Ala Glu Lys Tyr Lys Ala Glu
            515                 520             525

Asp Glu Lys Gln Arg Asp Lys Val Ser Ser Lys Asn Ser Leu Glu Ser
            530                 535             540

Tyr Ala Phe Asn Met Lys Ala Thr Val Glu Asp Glu Lys Leu Gln Gly
545                 550             555             560

Lys Ile Asn Asp Glu Asp Lys Gln Lys Ile Leu Asp Lys Cys Asn Glu
                    565                 570             575

Ile Ile Asn Trp Leu Asp Lys Asn Gln Thr Ala Glu Lys Glu Glu Phe
            580                 585             590

Glu His Gln Gln Lys Glu Leu Glu Lys Val Cys Asn Pro Ile Ile Thr
            595                 600             605

Lys Leu Tyr Gln Ser Ala Gly Gly Met Pro Gly Gly Met Pro Gly Gly
            610                 615             620
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59

```
Phe Pro Gly Gly Gly Ala Pro Pro Ser Gly Gly Ala Ser Ser Gly Pro
625             630         635             640


Thr Ile Glu Glu Val Asp
            645



<210>   44
<211>   3827
<212>   DNA
<213>   Staphylococcus aureus

<220>
<221>   CDS
<222>   (151)..(3702)
<223>


<400>   44
atgcacttgt attcgttata ctgtatatat tttgcataat aaaataataa tatgaatttt       60

tgataaattt cattgaataa gaactaaatt agtttataat ttattattag tatcctgtgg      120

atatgacata gagtataagg aggggttttt atg aac aaa aat gtg ttg aag ttt      174
                                   Met Asn Lys Asn Val Leu Lys Phe
                                    1               5

atg gtc ttt ata atg tta tta aat atc atc aca cct tta ttt aat aaa      222
Met Val Phe Ile Met Leu Leu Asn Ile Ile Thr Pro Leu Phe Asn Lys
    10              15              20

aat gaa gca ttt gca gca cga gat att tca tca acg aat gtt aca gat      270
Asn Glu Ala Phe Ala Ala Arg Asp Ile Ser Ser Thr Asn Val Thr Asp
25              30              35              40

tta act gta tca ccg tct aag ata gaa gat ggt ggt aaa acg aca gta      318
Leu Thr Val Ser Pro Ser Lys Ile Glu Asp Gly Gly Lys Thr Thr Val
                45              50              55

aaa atg acg ttc gac gat aaa aat gga aaa ata caa aat ggt gac atg      366
Lys Met Thr Phe Asp Asp Lys Asn Gly Lys Ile Gln Asn Gly Asp Met
                60              65              70

att aaa gtg gca tgg ccg aca agc ggt aca gta aag ata gag ggt tat      414
Ile Lys Val Ala Trp Pro Thr Ser Gly Thr Val Lys Ile Glu Gly Tyr
            75              80              85

agt aaa aca gta cca tta act gtt aaa ggt gaa cag gtg ggt caa gca      462
Ser Lys Thr Val Pro Leu Thr Val Lys Gly Glu Gln Val Gly Gln Ala
        90              95              100

gtt att aca cca gac ggt gca aca att aca ttc aat gat aaa gta gaa      510
Val Ile Thr Pro Asp Gly Ala Thr Ile Thr Phe Asn Asp Lys Val Glu
105             110             115             120
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60

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aaa tta agt gat gtt tcg gga ttt gca gaa ttt gaa gta caa gga aga        558
Lys Leu Ser Asp Val Ser Gly Phe Ala Glu Phe Glu Val Gln Gly Arg
            125             130             135

aat tta acg caa aca aat act tca gat gac aaa gta gct acg ata aca        606
Asn Leu Thr Gln Thr Asn Thr Ser Asp Asp Lys Val Ala Thr Ile Thr
            140             145             150

tct ggg aat aaa tca acg aat gtt acg gtt cat aaa agt gaa gcg gga        654
Ser Gly Asn Lys Ser Thr Asn Val Thr Val His Lys Ser Glu Ala Gly
            155             160             165

aca agt agt gtt ttc tat tat aaa acg gga gat atg cta cca gaa gat        702
Thr Ser Ser Val Phe Tyr Tyr Lys Thr Gly Asp Met Leu Pro Glu Asp
            170             175             180

acg aca cat gta cga tgg ttt tta aat att aac aat gaa aaa agt tat        750
Thr Thr His Val Arg Trp Phe Leu Asn Ile Asn Asn Glu Lys Ser Tyr
185             190             195             200

gta tcg aaa gat att act ata aag gat cag att caa ggt gga cag cag        798
Val Ser Lys Asp Ile Thr Ile Lys Asp Gln Ile Gln Gly Gly Gln Gln
            205             210             215

tta gat tta agc aca tta aac att aat gtg aca ggt aca cat agc aat        846
Leu Asp Leu Ser Thr Leu Asn Ile Asn Val Thr Gly Thr His Ser Asn
            220             225             230

tat tat agt gga caa agt gca att act gat ttt gaa aaa gcc ttt cca        894
Tyr Tyr Ser Gly Gln Ser Ala Ile Thr Asp Phe Glu Lys Ala Phe Pro
            235             240             245

ggt tct aaa ata act gtt gat aat acg aag aac aca att gat gta aca        942
Gly Ser Lys Ile Thr Val Asp Asn Thr Lys Asn Thr Ile Asp Val Thr
            250             255             260

att cca caa ggc tat ggg tca tat aat agt ttt tca att aac tac aaa        990
Ile Pro Gln Gly Tyr Gly Ser Tyr Asn Ser Phe Ser Ile Asn Tyr Lys
265             270             275             280

acc aaa att acg aat gaa cag caa aaa gag ttt gtt aat aat tca caa       1038
Thr Lys Ile Thr Asn Glu Gln Gln Lys Glu Phe Val Asn Asn Ser Gln
            285             290             295

gct tgg tat caa gag cat ggt aag gaa gaa gtg aac ggg aaa tca ttt       1086
Ala Trp Tyr Gln Glu His Gly Lys Glu Glu Val Asn Gly Lys Ser Phe
            300             305             310

aat cat act gtg cac aat att aat gct aat gcc ggt att gaa ggt act       1134
Asn His Thr Val His Asn Ile Asn Ala Asn Ala Gly Ile Glu Gly Thr
            315             320             325

gta aaa ggt gaa tta aaa gtt tta aaa cag gat aaa gat acc aag gct       1182
Val Lys Gly Glu Leu Lys Val Leu Lys Gln Asp Lys Asp Thr Lys Ala
            330             335             340
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61

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cct ata gct aat gta aaa ttt aaa ctt tct aaa aaa gat gga tca gtt      1230
Pro Ile Ala Asn Val Lys Phe Lys Leu Ser Lys Lys Asp Gly Ser Val
345             350             355             360

gta aag gac aat caa aaa gaa att gag att ata aca gat gca aac ggt      1278
Val Lys Asp Asn Gln Lys Glu Ile Glu Ile Ile Thr Asp Ala Asn Gly
                365             370             375

att gct aat att aaa gcg ttg cct agt gga gac tat att tta aaa gaa      1326
Ile Ala Asn Ile Lys Ala Leu Pro Ser Gly Asp Tyr Ile Leu Lys Glu
            380             385             390

ata gag gcg cca cga ccg tat aca ttt gat aag gat aaa gaa tat ccg      1374
Ile Glu Ala Pro Arg Pro Tyr Thr Phe Asp Lys Asp Lys Glu Tyr Pro
            395             400             405

ttt act atg aaa gat aca gat aat cag gga tat ttt acg act att gaa      1422
Phe Thr Met Lys Asp Thr Asp Asn Gln Gly Tyr Phe Thr Thr Ile Glu
    410             415             420

aat gca aaa gcg ata gaa aaa aca aaa gat gtt tct gct caa aag gtt      1470
Asn Ala Lys Ala Ile Glu Lys Thr Lys Asp Val Ser Ala Gln Lys Val
425             430             435             440

tgg gaa ggc act caa aaa gtg aaa cca acg att tat ttc aag ttg tac      1518
Trp Glu Gly Thr Gln Lys Val Lys Pro Thr Ile Tyr Phe Lys Leu Tyr
                445             450             455

aaa caa gat gac aat caa aat aca aca cca gta gac aaa gca gag att      1566
Lys Gln Asp Asp Asn Gln Asn Thr Thr Pro Val Asp Lys Ala Glu Ile
            460             465             470

aaa aaa tta gaa gat gga acg aca aaa gtg aca tgg tct aat ctt ccg      1614
Lys Lys Leu Glu Asp Gly Thr Thr Lys Val Thr Trp Ser Asn Leu Pro
            475             480             485

gaa aat gac aaa aat ggc aag gct att aaa tat tta gtt aaa gaa gta      1662
Glu Asn Asp Lys Asn Gly Lys Ala Ile Lys Tyr Leu Val Lys Glu Val
    490             495             500

aat gct caa ggt gaa gat aca aca cca gaa gga tat act aaa aaa gaa      1710
Asn Ala Gln Gly Glu Asp Thr Thr Pro Glu Gly Tyr Thr Lys Lys Glu
505             510             515             520

aat ggt tta gtg gtt act aat act gaa aaa cca atc gaa aca aca tca      1758
Asn Gly Leu Val Val Thr Asn Thr Glu Lys Pro Ile Glu Thr Thr Ser
                525             530             535

att agt ggt gaa aaa gta tgg gac gac aaa gac aat caa gat ggt aag      1806
Ile Ser Gly Glu Lys Val Trp Asp Asp Lys Asp Asn Gln Asp Gly Lys
            540             545             550

aga cca gaa aaa gtc agt gtg aat tta ttg gct aac ggg gag aaa gta      1854
Arg Pro Glu Lys Val Ser Val Asn Leu Leu Ala Asn Gly Glu Lys Val
            555             560             565
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62

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aaa acg tta gac gtg aca tct gaa aca aac tgg aag tac gaa ttt aaa        1902
Lys Thr Leu Asp Val Thr Ser Glu Thr Asn Trp Lys Tyr Glu Phe Lys
    570                 575                 580

gac tta ccg aag tat gat gaa gga aag aaa ata gaa tat aca gtg acc        1950
Asp Leu Pro Lys Tyr Asp Glu Gly Lys Lys Ile Glu Tyr Thr Val Thr
585                 590                 595                 600

gaa gat cac gta aaa gac tac aca aca gac atc aac ggt acg aca ata        1998
Glu Asp His Val Lys Asp Tyr Thr Thr Asp Ile Asn Gly Thr Thr Ile
                605                 610                 615

acg aac aag tat aca cca gga gag aca tcg gca aca gta aca aaa aat        2046
Thr Asn Lys Tyr Thr Pro Gly Glu Thr Ser Ala Thr Val Thr Lys Asn
                620                 625                 630

tgg gat gac aat aat aac caa gac gga aaa cga cca act gaa atc aaa        2094
Trp Asp Asp Asn Asn Asn Gln Asp Gly Lys Arg Pro Thr Glu Ile Lys
                635                 640                 645

gtt gag tta tat caa gat gga aaa gca aca gga aaa acg gca ata tta        2142
Val Glu Leu Tyr Gln Asp Gly Lys Ala Thr Gly Lys Thr Ala Ile Leu
    650                 655                 660

aat gaa tct aat aac tgg aca cat acg tgg aca gga tta gat gaa aaa        2190
Asn Glu Ser Asn Asn Trp Thr His Thr Trp Thr Gly Leu Asp Glu Lys
665                 670                 675                 680

gca aaa gga caa caa gta aaa tac aca gtc gag gaa tta aca aag gtc        2238
Ala Lys Gly Gln Gln Val Lys Tyr Thr Val Glu Glu Leu Thr Lys Val
                685                 690                 695

aaa ggt tat aca aca cat gtg gat aac aat gat atg ggt aac ttg att        2286
Lys Gly Tyr Thr Thr His Val Asp Asn Asn Asp Met Gly Asn Leu Ile
                700                 705                 710

gtg acg aat aaa tat acg cca gaa aca aca tca att agt ggt gaa aaa        2334
Val Thr Asn Lys Tyr Thr Pro Glu Thr Thr Ser Ile Ser Gly Glu Lys
                715                 720                 725

gta tgg gac gac aaa gac aat caa gat ggt aag aga cca gaa aaa gtc        2382
Val Trp Asp Asp Lys Asp Asn Gln Asp Gly Lys Arg Pro Glu Lys Val
    730                 735                 740

agt gtg aat tta ttg gct gat gga gag aaa gta aaa acg tta gac gtg        2430
Ser Val Asn Leu Leu Ala Asp Gly Glu Lys Val Lys Thr Leu Asp Val
745                 750                 755                 760

aca tct gaa aca aac tgg aag tac gaa ttt aaa gac tta ccg aag tat        2478
Thr Ser Glu Thr Asn Trp Lys Tyr Glu Phe Lys Asp Leu Pro Lys Tyr
                765                 770                 775

gat gaa gga aag aaa ata gaa tat aca gtg acc gaa gat cac gta aaa        2526
Asp Glu Gly Lys Lys Ile Glu Tyr Thr Val Thr Glu Asp His Val Lys
                780                 785                 790
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63

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gac tac aca aca gac atc aac ggt acg aca ata acg aac aag tat aca        2574
Asp Tyr Thr Thr Asp Ile Asn Gly Thr Thr Ile Thr Asn Lys Tyr Thr
        795             800             805

cca gga gag aca tcg gca aca gta aca aaa aat tgg gat gac aat aat        2622
Pro Gly Glu Thr Ser Ala Thr Val Thr Lys Asn Trp Asp Asp Asn Asn
        810             815             820

aac caa gac gga aaa cga cca act gaa atc aaa gtt gag tta tat caa        2670
Asn Gln Asp Gly Lys Arg Pro Thr Glu Ile Lys Val Glu Leu Tyr Gln
825             830             835             840

gat gga aaa gca aca gga aaa acg gca ata tta aat gaa tct aat aac        2718
Asp Gly Lys Ala Thr Gly Lys Thr Ala Ile Leu Asn Glu Ser Asn Asn
            845             850             855

tgg aca cat acg tgg aca gga tta gat gaa aaa gca aaa gga caa caa        2766
Trp Thr His Thr Trp Thr Gly Leu Asp Glu Lys Ala Lys Gly Gln Gln
            860             865             870

gta aaa tac aca gtc gag gaa tta aca aag gtc aaa ggt tat aca aca        2814
Val Lys Tyr Thr Val Glu Glu Leu Thr Lys Val Lys Gly Tyr Thr Thr
        875             880             885

cat gtg gat aac aat gat atg ggc aac ttg att gtg acg aat aaa tat        2862
His Val Asp Asn Asn Asp Met Gly Asn Leu Ile Val Thr Asn Lys Tyr
        890             895             900

acg cca gaa aca aca tca att agt ggt gaa aaa gta tgg gac gac aaa        2910
Thr Pro Glu Thr Thr Ser Ile Ser Gly Glu Lys Val Trp Asp Asp Lys
905             910             915             920

gac aat caa gat ggt aag aga cca gaa aaa gtc agt gtg aat tta ttg        2958
Asp Asn Gln Asp Gly Lys Arg Pro Glu Lys Val Ser Val Asn Leu Leu
            925             930             935

gct aac gga gag aaa gta aaa acg tta gac gtg aca tct gaa aca aac        3006
Ala Asn Gly Glu Lys Val Lys Thr Leu Asp Val Thr Ser Glu Thr Asn
            940             945             950

tgg aag tac gaa ttt aaa gac tta ccg aag tat gat gaa gga aag aaa        3054
Trp Lys Tyr Glu Phe Lys Asp Leu Pro Lys Tyr Asp Glu Gly Lys Lys
        955             960             965

ata gaa tat aca gtg acc gaa gat cac gta aaa gac tac aca aca gac        3102
Ile Glu Tyr Thr Val Thr Glu Asp His Val Lys Asp Tyr Thr Thr Asp
        970             975             980

atc aac ggt acg aca ata acg aac aag tat aca cca gga gag aca tcg        3150
Ile Asn Gly Thr Thr Ile Thr Asn Lys Tyr Thr Pro Gly Glu Thr Ser
985             990             995             1000

gca aca gta aca aaa  aat tgg gat gac aat  aat aac caa gac gga          3195
Ala Thr Val Thr Lys Asn Trp Asp Asp Asn  Asn Asn Gln Asp Gly
            1005            1010            1015
```

64

```
aaa cga cca act gaa  atc aaa gtt gag tta  tat caa gat gga aaa        3240
Lys Arg Pro Thr Glu  Ile Lys Val Glu Leu  Tyr Gln Asp Gly Lys
            1020              1025                  1030

gca aca gga aaa acg  gca ata tta aat gaa  tct aat aac tgg aca        3285
Ala Thr Gly Lys Thr  Ala Ile Leu Asn Glu  Ser Asn Asn Trp Thr
            1035              1040                  1045

cat acg tgg aca gga  tta gat gaa aaa gca  aaa gga caa caa gta        3330
His Thr Trp Thr Gly  Leu Asp Glu Lys Ala  Lys Gly Gln Gln Val
            1050              1055                  1060

aaa tac aca gtc gat  gaa tta aca aaa gtt  aat ggc tat aca acg        3375
Lys Tyr Thr Val Asp  Glu Leu Thr Lys Val  Asn Gly Tyr Thr Thr
            1065              1070                  1075

cat gtg gat aac aat  gat atg ggt aac ttg  att gtg aca aat aaa        3420
His Val Asp Asn Asn  Asp Met Gly Asn Leu  Ile Val Thr Asn Lys
            1080              1085                  1090

tat acg ccg aaa aaa  ccg aat aaa cca atc  tat cct gaa aaa cca        3465
Tyr Thr Pro Lys Lys  Pro Asn Lys Pro Ile  Tyr Pro Glu Lys Pro
            1095              1100                  1105

aaa gac aaa aca cca  cca act aaa cct gat  cat tct aat aaa gtt        3510
Lys Asp Lys Thr Pro  Pro Thr Lys Pro Asp  His Ser Asn Lys Val
            1110              1115                  1120

aaa cca act ccc cca  gat aag cca tca aaa  gtg gat aag gat gat        3555
Lys Pro Thr Pro Pro  Asp Lys Pro Ser Lys  Val Asp Lys Asp Asp
            1125              1130                  1135

caa cct aaa gat aat  aaa acc aaa cct gaa  aat cct cta aaa gaa        3600
Gln Pro Lys Asp Asn  Lys Thr Lys Pro Glu  Asn Pro Leu Lys Glu
            1140              1145                  1150

tta cca aaa act ggt  atg aag att ata act  tca tgg att aca tgg        3645
Leu Pro Lys Thr Gly  Met Lys Ile Ile Thr  Ser Trp Ile Thr Trp
            1155              1160                  1165

gta ttt ata ggt ata  ttg gga ctg tat tta  att tta aga aaa aga        3690
Val Phe Ile Gly Ile  Leu Gly Leu Tyr Leu  Ile Leu Arg Lys Arg
            1170              1175                  1180

ttt aac tca taa accattataa ttattttat agataaggct attcttagtt         3742
Phe Asn Ser


ctatgtataa tacatgtata ttaataggtc acttttaatc tgtatgtaag cagactaaga   3802

gtggcctttt aaacaaataa aaaaa                                         3827
```

65

<210> 45
<211> 1183
<212> PRT
<213> Staphylococcus aureus

<400> 45

```
Met Asn Lys Asn Val Leu Lys Phe Met Val Phe Ile Met Leu Leu Asn
1               5                   10                  15


Ile Ile Thr Pro Leu Phe Asn Lys Asn Glu Ala Phe Ala Ala Arg Asp
            20                  25                  30


Ile Ser Ser Thr Asn Val Thr Asp Leu Thr Val Ser Pro Ser Lys Ile
        35                  40                  45


Glu Asp Gly Gly Lys Thr Thr Val Lys Met Thr Phe Asp Asp Lys Asn
    50                  55                  60


Gly Lys Ile Gln Asn Gly Asp Met Ile Lys Val Ala Trp Pro Thr Ser
65                  70                  75                  80


Gly Thr Val Lys Ile Glu Gly Tyr Ser Lys Thr Val Pro Leu Thr Val
                85                  90                  95


Lys Gly Glu Gln Val Gly Gln Ala Val Ile Thr Pro Asp Gly Ala Thr
                100                 105                 110


Ile Thr Phe Asn Asp Lys Val Glu Lys Leu Ser Asp Val Ser Gly Phe
        115                 120                 125


Ala Glu Phe Glu Val Gln Gly Arg Asn Leu Thr Gln Thr Asn Thr Ser
    130                 135                 140


Asp Asp Lys Val Ala Thr Ile Thr Ser Gly Asn Lys Ser Thr Asn Val
145                 150                 155                 160


Thr Val His Lys Ser Glu Ala Gly Thr Ser Ser Val Phe Tyr Tyr Lys
                165                 170                 175


Thr Gly Asp Met Leu Pro Glu Asp Thr Thr His Val Arg Trp Phe Leu
                180                 185                 190
```

66

```
Asn Ile Asn Asn Glu Lys Ser Tyr Val Ser Lys Asp Ile Thr Ile Lys
         195                 200             205

Asp Gln Ile Gln Gly Gly Gln Gln Leu Asp Leu Ser Thr Leu Asn Ile
    210             215                 220

Asn Val Thr Gly Thr His Ser Asn Tyr Tyr Ser Gly Gln Ser Ala Ile
225             230                 235                 240

Thr Asp Phe Glu Lys Ala Phe Pro Gly Ser Lys Ile Thr Val Asp Asn
             245             250             255

Thr Lys Asn Thr Ile Asp Val Thr Ile Pro Gln Gly Tyr Gly Ser Tyr
         260             265             270

Asn Ser Phe Ser Ile Asn Tyr Lys Thr Lys Ile Thr Asn Glu Gln Gln
         275             280             285

Lys Glu Phe Val Asn Asn Ser Gln Ala Trp Tyr Gln Glu His Gly Lys
    290             295             300

Glu Glu Val Asn Gly Lys Ser Phe Asn His Thr Val His Asn Ile Asn
305             310             315             320

Ala Asn Ala Gly Ile Glu Gly Thr Val Lys Gly Glu Leu Lys Val Leu
         325             330             335

Lys Gln Asp Lys Asp Thr Lys Ala Pro Ile Ala Asn Val Lys Phe Lys
         340             345             350

Leu Ser Lys Lys Asp Gly Ser Val Val Lys Asp Asn Gln Lys Glu Ile
    355             360             365

Glu Ile Ile Thr Asp Ala Asn Gly Ile Ala Asn Ile Lys Ala Leu Pro
    370             375             380

Ser Gly Asp Tyr Ile Leu Lys Glu Ile Glu Ala Pro Arg Pro Tyr Thr
385             390             395             400

Phe Asp Lys Asp Lys Glu Tyr Pro Phe Thr Met Lys Asp Thr Asp Asn
             405             410             415
```

67

```
Gln Gly Tyr Phe Thr Thr Ile Glu Asn Ala Lys Ala Ile Glu Lys Thr
            420             425             430

Lys Asp Val Ser Ala Gln Lys Val Trp Glu Gly Thr Gln Lys Val Lys
            435             440             445

Pro Thr Ile Tyr Phe Lys Leu Tyr Lys Gln Asp Asp Asn Gln Asn Thr
    450             455             460

Thr Pro Val Asp Lys Ala Glu Ile Lys Lys Leu Glu Asp Gly Thr Thr
465             470             475             480

Lys Val Thr Trp Ser Asn Leu Pro Glu Asn Asp Lys Asn Gly Lys Ala
            485             490             495

Ile Lys Tyr Leu Val Lys Glu Val Asn Ala Gln Gly Glu Asp Thr Thr
            500             505             510

Pro Glu Gly Tyr Thr Lys Lys Glu Asn Gly Leu Val Val Thr Asn Thr
            515             520             525

Glu Lys Pro Ile Glu Thr Thr Ser Ile Ser Gly Glu Lys Val Trp Asp
    530             535             540

Asp Lys Asp Asn Gln Asp Gly Lys Arg Pro Glu Lys Val Ser Val Asn
545             550             555             560

Leu Leu Ala Asn Gly Glu Lys Val Lys Thr Leu Asp Val Thr Ser Glu
                565             570             575

Thr Asn Trp Lys Tyr Glu Phe Lys Asp Leu Pro Lys Tyr Asp Glu Gly
            580             585             590

Lys Lys Ile Glu Tyr Thr Val Thr Glu Asp His Val Lys Asp Tyr Thr
            595             600             605

Thr Asp Ile Asn Gly Thr Thr Ile Thr Asn Lys Tyr Thr Pro Gly Glu
    610             615             620

Thr Ser Ala Thr Val Thr Lys Asn Trp Asp Asp Asn Asn Asn Gln Asp
625             630             635             640
```

68

Gly Lys Arg Pro Thr Glu Ile Lys Val Glu Leu Tyr Gln Asp Gly Lys
                    645   650   655

Ala Thr Gly Lys Thr Ala Ile Leu Asn Glu Ser Asn Asn Trp Thr His
                660   665   670

Thr Trp Thr Gly Leu Asp Glu Lys Ala Lys Gly Gln Gln Val Lys Tyr
        675   680   685

Thr Val Glu Glu Leu Thr Lys Val Lys Gly Tyr Thr Thr His Val Asp
        690   695   700

Asn Asn Asp Met Gly Asn Leu Ile Val Thr Asn Lys Tyr Thr Pro Glu
705   710   715   720

Thr Thr Ser Ile Ser Gly Glu Lys Val Trp Asp Asp Lys Asp Asn Gln
                725   730   735

Asp Gly Lys Arg Pro Glu Lys Val Ser Val Asn Leu Leu Ala Asp Gly
            740   745   750

Glu Lys Val Lys Thr Leu Asp Val Thr Ser Glu Thr Asn Trp Lys Tyr
        755   760   765

Glu Phe Lys Asp Leu Pro Lys Tyr Asp Glu Gly Lys Lys Ile Glu Tyr
    770   775   780

Thr Val Thr Glu Asp His Val Lys Asp Tyr Thr Thr Asp Ile Asn Gly
785   790   795   800

Thr Thr Ile Thr Asn Lys Tyr Thr Pro Gly Glu Thr Ser Ala Thr Val
                805   810   815

Thr Lys Asn Trp Asp Asp Asn Asn Asn Gln Asp Gly Lys Arg Pro Thr
            820   825   830

Glu Ile Lys Val Glu Leu Tyr Gln Asp Gly Lys Ala Thr Gly Lys Thr
        835   840   845

Ala Ile Leu Asn Glu Ser Asn Asn Trp Thr His Thr Trp Thr Gly Leu
850   855   860

69

Asp Glu Lys Ala Lys Gly Gln Gln Val Lys Tyr Thr Val Glu Glu Leu
865   870   875   880

Thr Lys Val Lys Gly Tyr Thr Thr His Val Asp Asn Asn Asp Met Gly
                885   890   895

Asn Leu Ile Val Thr Asn Lys Tyr Thr Pro Glu Thr Thr Ser Ile Ser
            900   905   910

Gly Glu Lys Val Trp Asp Asp Lys Asp Asn Gln Asp Gly Lys Arg Pro
        915   920   925

Glu Lys Val Ser Val Asn Leu Leu Ala Asn Gly Glu Lys Val Lys Thr
        930   935   940

Leu Asp Val Thr Ser Glu Thr Asn Trp Lys Tyr Glu Phe Lys Asp Leu
945   950   955   960

Pro Lys Tyr Asp Glu Gly Lys Lys Ile Glu Tyr Thr Val Thr Glu Asp
            965   970   975

His Val Lys Asp Tyr Thr Thr Asp Ile Asn Gly Thr Thr Ile Thr Asn
            980   985   990

Lys Tyr Thr Pro Gly Glu Thr Ser Ala Thr Val Thr Lys Asn Trp Asp
        995   1000   1005

Asp Asn Asn Asn Gln Asp Gly Lys Arg Pro Thr Glu Ile Lys Val
    1010   1015   1020

Glu Leu Tyr Gln Asp Gly Lys Ala Thr Gly Lys Thr Ala Ile Leu
    1025   1030   1035

Asn Glu Ser Asn Asn Trp Thr His Thr Trp Thr Gly Leu Asp Glu
    1040   1045   1050

Lys Ala Lys Gly Gln Gln Val Lys Tyr Thr Val Asp Glu Leu Thr
    1055   1060   1065

Lys Val Asn Gly Tyr Thr Thr His Val Asp Asn Asn Asp Met Gly
    1070   1075   1080

70

```
Asn Leu   Ile Val Thr Asn Lys   Tyr Thr Pro Lys Lys   Pro Asn Lys
    1085                  1090              1095


Pro Ile   Tyr Pro Glu Lys Pro   Lys Asp Lys Thr Pro   Pro Thr Lys
    1100                  1105              1110


Pro Asp   His Ser Asn Lys Val   Lys Pro Thr Pro Pro   Asp Lys Pro
    1115                  1120              1125


Ser Lys   Val Asp Lys Asp Asp   Gln Pro Lys Asp Asn   Lys Thr Lys
    1130                  1135              1140


Pro Glu   Asn Pro Leu Lys Glu   Leu Pro Lys Thr Gly   Met Lys Ile
    1145                  1150              1155


Ile Thr   Ser Trp Ile Thr Trp   Val Phe Ile Gly Ile   Leu Gly Leu
    1160                  1165              1170


Tyr Leu   Ile Leu Arg Lys Arg   Phe Asn Ser
    1175                  1180
```

<210> 46
<211> 9
<212> PRT
<213> Homo sapiens

<220>
<221> MISC_FEATURE
<222> (4)..(4)
<223> Xaa can be any amino acid

<220>
<221> MISC_FEATURE
<222> (6)..(7)
<223> Xaa can be any amino acid

<400> 46

```
Ile Leu Val Xaa Tyr Xaa Xaa Leu Val
1               5
```

<210> 47
<211> 209
<212> PRT
<213> Homo sapiens

71

<400> 47

Met Ser Pro His Pro Thr Ala Leu Leu Gly Leu Val Leu Cys Leu Ala
1   5   10   15

Gln Thr Ile His Thr Gln Glu Glu Asp Leu Pro Arg Pro Ser Ile Ser
            20   25   30

Ala Glu Pro Gly Thr Val Ile Pro Leu Gly Ser His Val Thr Phe Val
        35   40   45

Cys Arg Gly Pro Val Gly Val Gln Thr Phe Arg Leu Glu Arg Glu Ser
    50   55   60

Arg Ser Thr Tyr Asn Asp Thr Glu Asp Val Ser Gln Ala Ser Pro Ser
65   70   75   80

Glu Ser Glu Ala Arg Phe Arg Ile Asp Ser Val Ser Glu Gly Asn Ala
                85   90   95

Gly Pro Tyr Arg Cys Ile Tyr Tyr Lys Pro Pro Lys Trp Ser Glu Gln
            100   105   110

Ser Asp Tyr Leu Glu Leu Leu Val Lys Glu Thr Ser Gly Gly Pro Asp
            115   120   125

Ser Pro Asp Thr Glu Pro Gly Ser Ser Ala Gly Pro Thr Gln Arg Pro
    130   135   140

Ser Asp Asn Ser His Asn Glu His Ala Pro Ala Ser Gln Gly Leu Lys
145   150   155   160

Ala Glu His Leu Tyr Ile Leu Ile Gly Val Ser Val Val Phe Leu Phe
            165   170   175

Cys Leu Leu Leu Leu Val Leu Phe Cys Leu His Arg Gln Asn Gln Ile
        180   185   190

Lys Gln Gly Pro Pro Arg Ser Lys Asp Glu Glu Gln Lys Pro Gln Gln
        195   200   205

Arg

72

<210> 48
<211> 410
<212> PRT
<213> Homo sapiens

<400> 48

Met Ser Leu Met Val Val Ser Met Ala Cys Val Gly Phe Phe Leu Leu
1   5   10   15

Glu Gly Pro Trp Pro His Val Gly Gly Gln Asp Lys Pro Phe Leu Ser
            20   25   30

Ala Trp Pro Gly Thr Val Val Ser Glu Gly Gln His Val Thr Leu Gln
        35   40   45

Cys Arg Ser His Leu Gly Phe Asn Glu Phe Ser Leu Ser Lys Glu Asp
    50   55   60

Gly Met Pro Val Pro Glu Leu Tyr Asn Arg Ile Phe Arg Asn Ser Phe
65   70   75   80

Leu Met Gly Pro Val Thr Pro Ala His Ala Gly Thr Tyr Arg Cys Cys
            85   90   95

Ser Ser His Pro His Ser Pro Thr Gly Trp Ser Ala Pro Ser Asn Pro
        100   105   110

Val Val Ile Met Val Thr Gly Val His Arg Lys Pro Ser Leu Leu Ala
        115   120   125

His Pro Gly Pro Leu Val Lys Ser Gly Glu Thr Val Ile Leu Gln Cys
    130   135   140

Trp Ser Asp Val Arg Phe Glu Arg Phe Leu Leu His Arg Glu Gly Ile
145   150   155   160

Thr Glu Asp Pro Leu Arg Leu Val Gly Gln Leu His Asp Ala Gly Ser
            165   170   175

Gln Val Asn Tyr Ser Met Gly Pro Met Thr Pro Ala Leu Ala Gly Thr
        180   185   190

73

Tyr Arg Cys Phe Gly Ser Val Thr His Leu Pro Tyr Glu Leu Ser Ala
     195   200   205

Pro Ser Asp Pro Leu Asp Ile Val Val Val Gly Leu Tyr Gly Lys Pro
  210   215   220

Ser Leu Ser Ala Gln Pro Gly Pro Thr Val Gln Ala Gly Glu Asn Val
225   230   235   240

Thr Leu Ser Cys Ser Ser Arg Ser Leu Phe Asp Ile Tyr His Leu Ser
        245   250   255

Arg Glu Ala Glu Ala Gly Glu Leu Arg Leu Thr Ala Val Leu Arg Val
        260   265   270

Asn Gly Thr Phe Gln Ala Asn Phe Pro Leu Gly Pro Val Thr His Gly
      275   280   285

Gly Asn Tyr Arg Cys Phe Gly Ser Phe Arg Ala Leu Pro His Ala Trp
  290   295   300

Ser Asp Pro Ser Asp Pro Leu Pro Val Ser Val Thr Gly Asn Ser Arg
305   310   315   320

Tyr Leu His Ala Leu Ile Gly Thr Ser Val Val Ile Ile Pro Phe Ala
        325   330   335

Ile Leu Leu Phe Phe Leu Leu His Arg Trp Cys Ala Asn Lys Lys Asn
        340   345   350

Ala Val Val Met Asp Gln Glu Pro Ala Gly Asn Arg Thr Val Asn Arg
      355   360   365

Glu Asp Ser Asp Glu Gln Asp Pro Gln Glu Val Thr Tyr Ala Gln Leu
  370   375   380

Asn His Cys Val Phe Thr Gln Arg Lys Ile Thr Arg Pro Ser Gln Arg
385   390   395   400

Pro Lys Thr Pro Pro Thr Asp Thr Ser Val
        405   410

74

<210> 49
<211> 237
<212> PRT
<213> Homo sapiens

<400> 49

```
Met Thr Ser Glu Ile Thr Tyr Ala Glu Val Arg Phe Lys Asn Glu Phe
1               5                   10                  15
```

```
Lys Ser Ser Gly Ile Asn Thr Ala Ser Ser Ala Ala Ser Lys Glu Arg
            20                  25                  30
```

```
Thr Ala Pro His Lys Ser Asn Thr Gly Phe Pro Lys Leu Leu Cys Ala
        35                  40                  45
```

```
Ser Leu Leu Ile Phe Phe Leu Leu Leu Ala Ile Ser Phe Phe Ile Ala
    50                  55                  60
```

```
Phe Val Ile Phe Phe Gln Lys Tyr Ser Gln Leu Leu Glu Lys Lys Thr
65                  70                  75                  80
```

```
Thr Lys Glu Leu Val His Thr Thr Leu Glu Cys Val Lys Lys Asn Met
                85                  90                  95
```

```
Pro Val Glu Glu Thr Ala Trp Ser Cys Cys Pro Lys Asn Trp Lys Ser
            100                 105                 110
```

```
Phe Ser Ser Asn Cys Tyr Phe Ile Ser Thr Glu Ser Ala Ser Trp Gln
        115                 120                 125
```

```
Asp Ser Glu Lys Asp Cys Ala Arg Met Glu Ala His Leu Leu Val Ile
    130                 135                 140
```

```
Asn Thr Gln Glu Glu Gln Asp Phe Ile Phe Gln Asn Leu Gln Glu Glu
145                 150                 155                 160
```

```
Ser Ala Tyr Phe Val Gly Leu Ser Asp Pro Glu Gly Gln Arg His Trp
                165                 170                 175
```

```
Gln Trp Val Asp Gln Thr Pro Tyr Asn Glu Ser Ser Thr Phe Trp His
                180                 185                 190
```

75

Pro Arg Glu Pro Ser Asp Pro Asn Glu Arg Cys Val Val Leu Asn Phe
     195   200   205

Arg Lys Ser Pro Lys Arg Trp Gly Trp Asn Asp Val Asn Cys Leu Gly
     210   215   220

Pro Gln Arg Ser Val Cys Glu Met Met Lys Ile His Leu
225   230   235

<210> 50
<211> 447
<212> PRT
<213> Homo sapiens

<400> 50

Met Ile Pro Thr Phe Thr Ala Leu Leu Cys Leu Gly Leu Ser Leu Gly
1   5   10   15

Pro Arg Thr His Met Gln Ala Gly Pro Leu Pro Lys Pro Thr Leu Trp
     20   25   30

Ala Glu Pro Gly Ser Val Ile Ser Trp Gly Asn Ser Val Thr Ile Trp
     35   40   45

Cys Gln Gly Thr Leu Glu Ala Arg Glu Tyr Arg Leu Asp Lys Glu Glu
     50   55   60

Ser Pro Ala Pro Trp Asp Arg Gln Asn Pro Leu Glu Pro Lys Asn Lys
65   70   75   80

Ala Arg Phe Ser Ile Pro Ser Met Thr Glu Asp Tyr Ala Gly Arg Tyr
         85   90   95

Arg Cys Tyr Tyr Arg Ser Pro Val Gly Trp Ser Gln Pro Ser Asp Pro
        100   105   110

Leu Glu Leu Val Met Thr Gly Ala Tyr Ser Lys Pro Thr Leu Ser Ala
     115   120   125

Leu Pro Ser Pro Leu Val Thr Ser Gly Lys Ser Val Thr Leu Leu Cys
     130   135   140

```
Gln Ser Arg Ser Pro Met Asp Thr Phe Leu Leu Ile Lys Glu Arg Ala
145             150             155             160

Ala His Pro Leu Leu His Leu Arg Ser Glu His Gly Ala Gln Gln His
            165             170                 175

Gln Ala Glu Phe Pro Met Ser Pro Val Thr Ser Val His Gly Gly Thr
            180             185                 190

Tyr Arg Cys Phe Ser Ser His Gly Phe Ser His Tyr Leu Leu Ser His
        195             200             205

Pro Ser Asp Pro Leu Glu Leu Ile Val Ser Gly Ser Leu Glu Gly Pro
    210             215             220

Arg Pro Ser Pro Thr Arg Ser Val Ser Thr Ala Ala Gly Pro Glu Asp
225             230             235             240

Gln Pro Leu Met Pro Thr Gly Ser Val Pro His Ser Gly Leu Arg Arg
            245             250                 255

His Trp Glu Val Leu Ile Gly Val Leu Val Val Ser Ile Leu Leu Leu
        260             265             270

Ser Leu Leu Leu Phe Leu Leu Leu Gln His Trp Arg Gln Gly Lys His
        275             280             285

Arg Thr Leu Ala Gln Arg Gln Ala Asp Phe Gln Arg Pro Pro Gly Ala
    290             295             300

Ala Glu Pro Glu Pro Lys Asp Gly Gly Leu Gln Arg Arg Ser Ser Pro
305             310             315             320

Ala Ala Asp Val Gln Gly Glu Asn Phe Cys Ala Ala Val Lys Asn Thr
            325             330             335

Gln Pro Glu Asp Gly Val Glu Met Asp Thr Arg Ser Pro His Asp Glu
            340             345             350

Asp Pro Gln Ala Val Thr Tyr Ala Lys Val Lys His Ser Arg Pro Arg
    355             360             365
```

77

Arg Glu Met Ala Ser Pro Pro Ser Pro Leu Ser Gly Glu Phe Leu Asp
    370   375   380

Thr Lys Asp Arg Gln Ala Glu Glu Asp Arg Gln Met Asp Thr Glu Ala
385   390   395   400

Ala Ala Ser Glu Ala Pro Gln Asp Val Thr Tyr Ala Gln Leu His Ser
                405   410   415

Phe Thr Leu Arg Gln Lys Ala Thr Glu Pro Pro Pro Ser Gln Glu Gly
            420   425   430

Ala Ser Pro Ala Glu Pro Ser Val Tyr Ala Thr Leu Ala Ile His
        435   440   445

<210> 51
<211> 1709
<212> PRT
<213> Homo sapiens

<400> 51

Met Gly Phe Leu Pro Lys Leu Leu Leu Ala Ser Phe Phe Pro Ala
1   5   10   15

Gly Gln Ala Ser Trp Gly Val Ser Ser Pro Gln Asp Val Gln Gly Val
        20   25   30

Lys Gly Ser Cys Leu Leu Ile Pro Cys Ile Phe Ser Phe Pro Ala Asp
        35   40   45

Val Glu Val Pro Asp Gly Ile Thr Ala Ile Trp Tyr Tyr Asp Tyr Ser
    50   55   60

Gly Gln Arg Gln Val Val Ser His Ser Ala Asp Pro Lys Leu Val Glu
65   70   75   80

Ala Arg Phe Arg Gly Arg Thr Glu Phe Met Gly Asn Pro Glu His Arg
            85   90   95

Val Cys Asn Leu Leu Leu Lys Asp Leu Gln Pro Glu Asp Ser Gly Ser
            100   105   110

Tyr Asn Phe Arg Phe Glu Ile Ser Glu Val Asn Arg Trp Ser Asp Val
115   120   125

Lys Gly Thr Leu Val Thr Val Thr Glu Glu Pro Arg Val Pro Thr Ile
130   135   140

Ala Ser Pro Val Glu Leu Leu Glu Gly Thr Glu Val Asp Phe Asn Cys
145   150   155   160

Ser Thr Pro Tyr Val Cys Leu Gln Glu Gln Val Arg Leu Gln Trp Gln
165   170   175

Gly Gln Asp Pro Ala Arg Ser Val Thr Phe Asn Ser Gln Lys Phe Glu
180   185   190

Pro Thr Gly Val Gly His Leu Glu Thr Leu His Met Ala Met Ser Trp
195   200   205

Gln Asp His Gly Arg Ile Leu Arg Cys Gln Leu Ser Val Ala Asn His
210   215   220

Arg Ala Gln Ser Glu Ile His Leu Gln Val Lys Tyr Ala Pro Lys Gly
225   230   235   240

Val Lys Ile Leu Leu Ser Pro Ser Gly Arg Asn Ile Leu Pro Gly Glu
245   250   255

Leu Val Thr Leu Thr Cys Gln Val Asn Ser Ser Tyr Pro Ala Val Ser
260   265   270

Ser Ile Lys Trp Leu Lys Asp Gly Val Arg Leu Gln Thr Lys Thr Gly
275   280   285

Val Leu His Leu Pro Gln Ala Ala Trp Ser Asp Ala Gly Val Tyr Thr
290   295   300

Cys Gln Ala Glu Asn Gly Val Gly Ser Leu Val Ser Pro Pro Ile Ser
305   310   315   320

Leu His Ile Phe Met Ala Glu Val Gln Val Ser Pro Ala Gly Pro Ile
325   330   335

79

Leu Glu Asn Gln Thr Val Thr Leu Val Cys Asn Thr Pro Asn Glu Ala
            340   345   350

Pro Ser Asp Leu Arg Tyr Ser Trp Tyr Lys Asn His Val Leu Leu Glu
            355   360   365

Asp Ala His Ser His Thr Leu Arg Leu His Leu Ala Thr Arg Ala Asp
    370   375   380

Thr Gly Phe Tyr Phe Cys Glu Val Gln Asn Val His Gly Ser Glu Arg
385   390   395   400

Ser Gly Pro Val Ser Val Val Val Asn His Pro Pro Leu Thr Pro Val
            405   410   415

Leu Thr Ala Phe Leu Glu Thr Gln Ala Gly Leu Val Gly Ile Leu His
            420   425   430

Cys Ser Val Val Ser Glu Pro Leu Ala Thr Leu Val Leu Ser His Gly
    435   440   445

Gly His Ile Leu Ala Ser Thr Ser Gly Asp Ser Asp His Ser Pro Arg
    450   455   460

Phe Ser Gly Thr Ser Gly Pro Asn Ser Leu Arg Leu Glu Ile Arg Asp
465   470   475   480

Leu Glu Glu Thr Asp Ser Gly Glu Tyr Lys Cys Ser Ala Thr Asn Ser
            485   490   495

Leu Gly Asn Ala Thr Ser Thr Leu Asp Phe His Ala Asn Ala Ala Arg
            500   505   510

Leu Leu Ile Ser Pro Ala Ala Glu Val Val Glu Gly Gln Ala Val Thr
            515   520   525

Leu Ser Cys Arg Ser Gly Leu Ser Pro Thr Pro Asp Ala Arg Phe Ser
    530   535   540

Trp Tyr Leu Asn Gly Ala Leu Leu His Glu Gly Pro Gly Ser Ser Leu
545   550   555   560

Leu Leu Pro Ala Ala Ser Ser Thr Asp Ala Gly Ser Tyr His Cys Arg
            565   570   575

Ala Arg Asp Gly His Ser Ala Ser Gly Pro Ser Ser Pro Ala Val Leu
            580   585   590

Thr Val Leu Tyr Pro Pro Arg Gln Pro Thr Phe Thr Thr Arg Leu Asp
            595   600   605

Leu Asp Ala Ala Gly Ala Gly Ala Gly Arg Arg Gly Leu Leu Leu Cys
            610   615   620

Arg Val Asp Ser Asp Pro Pro Ala Arg Leu Gln Leu Leu His Lys Asp
625   630   635   640

Arg Val Val Ala Thr Ser Leu Pro Ser Gly Gly Gly Cys Ser Thr Cys
            645   650   655

Gly Gly Cys Ser Pro Arg Met Lys Val Thr Lys Ala Pro Asn Leu Leu
            660   665   670

Arg Val Glu Ile His Asn Pro Leu Leu Glu Glu Glu Gly Leu Tyr Leu
            675   680   685

Cys Glu Ala Ser Asn Ala Leu Gly Asn Ala Ser Thr Ser Ala Thr Phe
            690   695   700

Asn Gly Gln Ala Thr Val Leu Ala Ile Ala Pro Ser His Thr Leu Gln
705   710   715   720

Glu Gly Thr Glu Ala Asn Leu Thr Cys Asn Val Ser Arg Glu Ala Ala
            725   730   735

Gly Ser Pro Ala Asn Phe Ser Trp Phe Arg Asn Gly Val Leu Trp Ala
            740   745   750

Gln Gly Pro Leu Glu Thr Val Thr Leu Leu Pro Val Ala Arg Thr Asp
            755   760   765

Ala Ala Leu Tyr Ala Cys Arg Ile Leu Thr Glu Ala Gly Ala Gln Leu
770   775   780

81

```
Ser Thr Pro Val Leu Leu Ser Val Leu Tyr Pro Pro Asp Arg Pro Lys
785               790             795                 800

Leu Ser Ala Leu Leu Asp Met Gly Gln Gly His Met Ala Leu Phe Ile
            805             810                 815

Cys Thr Val Asp Ser Arg Pro Leu Ala Leu Leu Ala Leu Phe His Gly
            820             825                 830

Glu His Leu Leu Ala Thr Ser Leu Gly Pro Gln Val Pro Ser His Gly
        835             840                 845

Arg Phe Gln Ala Lys Ala Glu Ala Asn Ser Leu Lys Leu Glu Val Arg
    850             855                 860

Glu Leu Gly Leu Gly Asp Ser Gly Ser Tyr Arg Cys Glu Ala Thr Asn
865             870             875                 880

Val Leu Gly Ser Ser Asn Thr Ser Leu Phe Phe Gln Val Arg Gly Ala
            885             890                 895

Trp Val Gln Val Ser Pro Ser Pro Glu Leu Gln Glu Gly Gln Ala Val
            900             905                 910

Val Leu Ser Cys Gln Val His Thr Gly Val Pro Glu Gly Thr Ser Tyr
        915             920                 925

Arg Trp Tyr Arg Asp Gly Gln Pro Leu Gln Glu Ser Thr Ser Ala Thr
    930             935                 940

Leu Arg Phe Ala Ala Ile Thr Leu Thr Gln Ala Gly Ala Tyr His Cys
945             950             955                 960

Gln Ala Gln Ala Pro Gly Ser Ala Thr Thr Ser Leu Ala Ala Pro Ile
            965             970                 975

Ser Leu His Val Ser Tyr Ala Pro Arg His Val Thr Leu Thr Thr Leu
        980             985                 990

Met Asp Thr Gly Pro Gly Arg Leu   Gly Leu Leu Leu Cys   Arg Val Asp
        995             1000                1005
```

82

```
Ser Asp  Pro Pro Ala Gln Leu  Arg Leu Leu His Gly  Asp Arg Leu
    1010             1015              1020

Val Ala  Ser Thr Leu Gln Gly  Val Gly Gly Pro Glu  Gly Ser Ser
    1025             1030              1035

Pro Arg  Leu His Val Ala Val  Ala Pro Asn Thr Leu  Arg Leu Glu
    1040             1045              1050

Ile His  Gly Ala Met Leu Glu  Asp Glu Gly Val Tyr  Ile Cys Glu
    1055             1060              1065

Ala Ser  Asn Thr Leu Gly Gln  Ala Ser Ala Ser Ala  Asp Phe Asp
    1070             1075              1080

Ala Gln  Ala Val Asn Val Gln  Val Trp Pro Gly Ala  Thr Val Arg
    1085             1090              1095

Glu Gly  Gln Leu Val Asn Leu  Thr Cys Leu Val Trp  Thr Thr His
    1100             1105              1110

Pro Ala  Gln Leu Thr Tyr Thr  Trp Tyr Gln Asp Gly  Gln Gln Arg
    1115             1120              1125

Leu Asp  Ala His Ser Ile Pro  Leu Pro Asn Val Thr  Val Arg Asp
    1130             1135              1140

Ala Thr  Ser Tyr Arg Cys Gly  Val Gly Pro Pro Gly  Arg Ala Pro
    1145             1150              1155

Arg Leu  Ser Arg Pro Ile Thr  Leu Asp Val Leu Tyr  Ala Pro Arg
    1160             1165              1170

Asn Leu  Arg Leu Thr Tyr Leu  Leu Glu Ser His Gly  Gly Gln Leu
    1175             1180              1185

Ala Leu  Val Leu Cys Thr Val  Asp Ser Arg Pro Pro  Ala Gln Leu
    1190             1195              1200

Ala Leu  Ser His Ala Gly Arg  Leu Leu Ala Ser Ser  Thr Ala Ala
    1205             1210              1215
```

83

```
Ser Val  Pro Asn Thr Leu Arg  Leu Glu Leu Arg Gly  Pro Gln Pro
    1220             1225             1230

Arg Asp  Glu Gly Phe Tyr Ser  Cys Ser Ala Arg Ser  Pro Leu Gly
    1235             1240             1245

Gln Ala  Asn Thr Ser Leu Glu  Leu Arg Leu Glu Gly  Val Arg Val
    1250             1255             1260

Ile Leu  Ala Pro Glu Ala Ala  Val Pro Glu Gly Ala  Pro Ile Thr
    1265             1270             1275

Val Thr  Cys Ala Asp Pro Ala  Ala His Ala Pro Thr  Leu Tyr Thr
    1280             1285             1290

Trp Tyr  His Asn Gly Arg Trp  Leu Gln Glu Gly Pro  Ala Ala Ser
    1295             1300             1305

Leu Ser  Phe Leu Val Ala Thr  Arg Ala His Ala Gly  Ala Tyr Ser
    1310             1315             1320

Cys Gln  Ala Gln Asp Ala Gln  Gly Thr Arg Ser Ser  Arg Pro Ala
    1325             1330             1335

Ala Leu  Gln Val Leu Tyr Ala  Pro Gln Asp Ala Val  Leu Ser Ser
    1340             1345             1350

Phe Arg  Asp Ser Arg Ala Arg  Ser Met Ala Val Ile  Gln Cys Thr
    1355             1360             1365

Val Asp  Ser Glu Pro Pro Ala  Glu Leu Ala Leu Ser  His Asp Gly
    1370             1375             1380

Lys Val  Leu Ala Thr Ser Ser  Gly Val His Ser Leu  Ala Ser Gly
    1385             1390             1395

Thr Gly  His Val Gln Val Ala  Arg Asn Ala Leu Arg  Leu Gln Val
    1400             1405             1410

Gln Asp  Val Pro Ala Gly Asp  Asp Thr Tyr Val Cys  Thr Ala Gln
    1415             1420             1425
```

84

```
Asn Leu  Leu Gly Ser Ile Ser  Thr Ile Gly Arg Leu  Gln Val Glu
    1430             1435            1440

Gly Ala  Arg Val Val Ala Glu  Pro Gly Leu Asp Val  Pro Glu Gly
    1445             1450            1455

Ala Ala  Leu Asn Leu Ser Cys  Arg Leu Leu Gly Gly  Pro Gly Pro
    1460             1465            1470

Val Gly  Asn Ser Thr Phe Ala  Trp Phe Trp Asn Asp  Arg Arg Leu
    1475             1480            1485

His Ala  Glu Pro Val Pro Thr  Leu Ala Phe Thr His  Val Ala Arg
    1490             1495            1500

Ala Gln  Ala Gly Met Tyr His  Cys Leu Ala Glu Leu  Pro Thr Gly
    1505             1510            1515

Ala Ala  Ala Ser Ala Pro Val  Met Leu Arg Val Leu  Tyr Pro Pro
    1520             1525            1530

Lys Thr  Pro Thr Met Met Val  Phe Val Glu Pro Glu  Gly Gly Leu
    1535             1540            1545

Arg Gly  Ile Leu Asp Cys Arg  Val Asp Ser Glu Pro  Leu Ala Ser
    1550             1555            1560

Leu Thr  Leu His Leu Gly Ser  Arg Leu Val Ala Ser  Ser Gln Pro
    1565             1570            1575

Gln Gly  Ala Pro Ala Glu Pro  His Ile His Val Leu  Ala Ser Pro
    1580             1585            1590

Asn Ala  Leu Arg Val Asp Ile  Glu Ala Leu Arg Pro  Ser Asp Gln
    1595             1600            1605

Gly Glu  Tyr Ile Cys Ser Ala  Ser Asn Val Leu Gly  Ser Ala Ser
    1610             1615            1620

Thr Ser  Thr Tyr Phe Gly Val  Arg Ala Leu His Arg  Leu His Gln
    1625             1630            1635
```

85

```
Phe Gln  Gln Leu Leu Trp Val  Leu Gly Leu Leu Val  Gly Leu Leu
    1640             1645             1650

Leu Leu  Leu Leu Gly Leu Gly  Ala Cys Tyr Thr Trp  Arg Arg Arg
    1655             1660             1665

Arg Val  Cys Lys Gln Ser Met  Gly Glu Asn Ser Val  Glu Met Ala
    1670             1675             1680

Phe Gln  Lys Glu Thr Thr Gln  Leu Ile Asp Pro Asp  Ala Ala Thr
    1685             1690             1695

Cys Glu  Thr Ser Thr Cys Ala  Pro Pro Leu Gly
    1700             1705
```

<210> 52
<211> 847
<212> PRT
<213> Homo sapiens

<400> 52

```
Met His Leu Leu Gly Pro Trp Leu Leu Leu Leu Val Leu Glu Tyr Leu
1             5             10             15

Ala Phe Ser Asp Ser Ser Lys Trp Val Phe Glu His Pro Glu Thr Leu
            20             25             30

Tyr Ala Trp Glu Gly Ala Cys Val Trp Ile Pro Cys Thr Tyr Arg Ala
            35             40             45

Leu Asp Gly Asp Leu Glu Ser Phe Ile Leu Phe His Asn Pro Glu Tyr
    50             55             60

Asn Lys Asn Thr Ser Lys Phe Asp Gly Thr Arg Leu Tyr Glu Ser Thr
65             70             75             80

Lys Asp Gly Lys Val Pro Ser Glu Gln Lys Arg Val Gln Phe Leu Gly
            85             90             95

Asp Lys Asn Lys Asn Cys Thr Leu Ser Ile His Pro Val His Leu Asn
        100             105             110
```

86

```
Asp Ser Gly Gln Leu Gly Leu Arg Met Glu Ser Lys Thr Glu Lys Trp
        115             120             125

Met Glu Arg Ile His Leu Asn Val Ser Glu Arg Pro Phe Pro Pro His
        130             135             140

Ile Gln Leu Pro Pro Glu Ile Gln Glu Ser Gln Glu Val Thr Leu Thr
145             150             155             160

Cys Leu Leu Asn Phe Ser Cys Tyr Gly Tyr Pro Ile Gln Leu Gln Trp
                165             170             175

Leu Leu Glu Gly Val Pro Met Arg Gln Ala Ala Val Thr Ser Thr Ser
            180             185             190

Leu Thr Ile Lys Ser Val Phe Thr Arg Ser Glu Leu Lys Phe Ser Pro
        195             200             205

Gln Trp Ser His His Gly Lys Ile Val Thr Cys Gln Leu Gln Asp Ala
    210             215             220

Asp Gly Lys Phe Leu Ser Asn Asp Thr Val Gln Leu Asn Val Lys His
225             230             235             240

Thr Pro Lys Leu Glu Ile Lys Val Thr Pro Ser Asp Ala Ile Val Arg
            245             250             255

Glu Gly Asp Ser Val Thr Met Thr Cys Glu Val Ser Ser Ser Asn Pro
            260             265             270

Glu Tyr Thr Thr Val Ser Trp Leu Lys Asp Gly Thr Ser Leu Lys Lys
        275             280             285

Gln Asn Thr Phe Thr Leu Asn Leu Arg Glu Val Thr Lys Asp Gln Ser
        290             295             300

Gly Lys Tyr Cys Cys Gln Val Ser Asn Asp Val Gly Pro Gly Arg Ser
305             310             315             320

Glu Glu Val Phe Leu Gln Val Gln Tyr Ala Pro Glu Pro Ser Thr Val
            325             330             335
```

87

```
Gln Ile Leu His Ser Pro Ala Val Glu Gly Ser Gln Val Glu Phe Leu
        340                 345                 350

Cys Met Ser Leu Ala Asn Pro Leu Pro Thr Asn Tyr Thr Trp Tyr His
        355                 360                 365

Asn Gly Lys Glu Met Gln Gly Arg Thr Glu Glu Lys Val His Ile Pro
    370                 375                 380

Lys Ile Leu Pro Trp His Ala Gly Thr Tyr Ser Cys Val Ala Glu Asn
385                 390                 395                 400

Ile Leu Gly Thr Gly Gln Arg Gly Pro Gly Ala Glu Leu Asp Val Gln
                405                 410                 415

Tyr Pro Pro Lys Lys Val Thr Thr Val Ile Gln Asn Pro Met Pro Ile
            420                 425                 430

Arg Glu Gly Asp Thr Val Thr Leu Ser Cys Asn Tyr Asn Ser Ser Asn
        435                 440                 445

Pro Ser Val Thr Arg Tyr Glu Trp Lys Pro His Gly Ala Trp Glu Glu
    450                 455                 460

Pro Ser Leu Gly Val Leu Lys Ile Gln Asn Val Gly Trp Asp Asn Thr
465                 470                 475                 480

Thr Ile Ala Cys Ala Arg Cys Asn Ser Trp Cys Ser Trp Ala Ser Pro
                485                 490                 495

Val Ala Leu Asn Val Gln Tyr Ala Pro Arg Asp Val Arg Val Arg Lys
                500                 505                 510

Ile Lys Pro Leu Ser Glu Ile His Ser Gly Asn Ser Val Ser Leu Gln
            515                 520                 525

Cys Asp Phe Ser Ser Ser His Pro Lys Glu Val Gln Phe Phe Trp Glu
        530                 535                 540

Lys Asn Gly Arg Leu Leu Gly Lys Glu Ser Gln Leu Asn Phe Asp Ser
545                 550                 555                 560
```

88

```
Ile Ser Pro Glu Asp Ala Gly Ser Tyr Ser Cys Trp Val Asn Asn Ser
            565             570             575

Ile Gly Gln Thr Ala Ser Lys Ala Trp Thr Leu Glu Val Leu Tyr Ala
            580             585             590

Pro Arg Arg Leu Arg Val Ser Met Ser Pro Gly Asp Gln Val Met Glu
            595             600             605

Gly Lys Ser Ala Thr Leu Thr Cys Glu Ser Asp Ala Asn Pro Pro Val
        610             615             620

Ser His Tyr Thr Trp Phe Asp Trp Asn Asn Gln Ser Leu Pro His His
    625             630             635             640

Ser Gln Lys Leu Arg Leu Glu Pro Val Lys Val Gln His Ser Gly Ala
                645             650             655

Tyr Trp Cys Gln Gly Thr Asn Ser Val Gly Lys Gly Arg Ser Pro Leu
            660             665             670

Ser Thr Leu Thr Val Tyr Tyr Ser Pro Glu Thr Ile Gly Arg Arg Val
            675             680             685

Ala Val Gly Leu Gly Ser Cys Leu Ala Ile Leu Ile Leu Ala Ile Cys
        690             695             700

Gly Leu Lys Leu Gln Arg Arg Trp Lys Arg Thr Gln Ser Gln Gln Gly
705             710             715             720

Leu Gln Glu Asn Ser Ser Gly Gln Ser Phe Phe Val Arg Asn Lys Lys
                725             730             735

Val Arg Arg Ala Pro Leu Ser Glu Gly Pro His Ser Leu Gly Cys Tyr
            740             745             750

Asn Pro Met Met Glu Asp Gly Ile Ser Tyr Thr Thr Leu Arg Phe Pro
        755             760             765

Glu Met Asn Ile Pro Arg Thr Gly Asp Ala Glu Ser Ser Glu Met Gln
        770             775             780
```

89

Arg Pro Pro Arg Thr Cys Asp Asp Thr Val Thr Tyr Ser Ala Leu His
785   790   795   800

Lys Arg Gln Val Gly Asp Tyr Glu Asn Val Ile Pro Asp Phe Pro Glu
        805   810   815

Asp Glu Gly Ile His Tyr Ser Glu Leu Ile Gln Phe Gly Val Gly Glu
        820   825   830

Arg Pro Gln Ala Gln Glu Asn Val Asp Tyr Val Ile Leu Lys His
        835   840   845

<210> 53
<211> 32
<212> PRT
<213> Homo sapiens

<220>
<221> MISC_FEATURE
<222> (2)..(2)
<223> Xaa is Ile or Leu

<220>
<221> MISC_FEATURE
<222> (3)..(3)
<223> Xaa can be any amino acid

<220>
<221> MISC_FEATURE
<222> (6)..(6)
<223> Xaa can be any amino acid

<220>
<221> MISC_FEATURE
<222> (8)..(25)
<223> Xaa can be any amino acid

<220>
<221> MISC_FEATURE
<222> (26)..(26)
<223> Xaa is Thr or Asn

<220>
<221> MISC_FEATURE
<222> (31)..(31)
<223> Xaa is Ile or Val

<220>
<221> MISC_FEATURE
<222> (32)..(32)
<223> Xaa is Lys or Arg

<400> 53

Glu Xaa Xaa Tyr Ala Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
1   5   10   15

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Glu Tyr Ser Glu Xaa Xaa
                20   25   30

<210> 54
<211> 6
<212> PRT
<213> Homo sapiens

<220>
<221> MISC_FEATURE
<222> (1)..(1)
<223> Xaa is Thr or Asn

<220>
<221> MISC_FEATURE
<222> (6)..(6)
<223> Xaa is Ile or Val

<400> 54

Xaa Glu Tyr Ser Glu Xaa
1   5

<210> 55
<211> 442
<212> PRT
<213> Homo sapiens

<400> 55

Met Leu Pro Leu Leu Leu Pro Leu Leu Trp Ala Gly Ala Leu Ala Gln
1   5   10   15

Glu Arg Arg Phe Gln Leu Glu Gly Pro Glu Ser Leu Thr Val Gln Glu
                20   25   30

Gly Leu Cys Val Leu Val Pro Cys Arg Leu Pro Thr Thr Leu Pro Ala
            35   40   45

Ser Tyr Tyr Gly Tyr Gly Tyr Trp Phe Leu Glu Gly Ala Asp Val Pro
        50   55   60

```
Val Ala Thr Asn Asp Pro Asp Glu Glu Val Gln Glu Glu Thr Arg Gly
65                  70              75                  80

Arg Phe His Leu Leu Trp Asp Pro Arg Arg Lys Asn Cys Ser Leu Ser
            85                  90                  95

Ile Arg Asp Ala Arg Arg Arg Asp Asn Ala Ala Tyr Phe Phe Arg Leu
            100             105             110

Lys Ser Lys Trp Met Lys Tyr Gly Tyr Thr Ser Ser Lys Leu Ser Val
        115             120             125

Arg Val Met Ala Leu Thr His Arg Pro Asn Ile Ser Ile Pro Gly Thr
        130             135             140

Leu Glu Ser Gly His Pro Ser Asn Leu Thr Cys Ser Val Pro Trp Val
145             150             155             160

Cys Glu Gln Gly Thr Pro Pro Ile Phe Ser Trp Met Ser Ala Ala Pro
            165             170             175

Thr Ser Leu Gly Pro Arg Thr Thr Gln Ser Ser Val Leu Thr Ile Thr
            180             185             190

Pro Arg Pro Gln Asp His Ser Thr Asn Leu Thr Cys Gln Val Thr Phe
        195             200             205

Pro Gly Ala Gly Val Thr Met Glu Arg Thr Ile Gln Leu Asn Val Ser
    210             215             220

Tyr Ala Pro Gln Lys Val Ala Ile Ser Ile Phe Gln Gly Asn Ser Ala
225             230             235             240

Ala Phe Lys Ile Leu Gln Asn Thr Ser Ser Leu Pro Val Leu Glu Gly
            245             250             255

Gln Ala Leu Arg Leu Leu Cys Asp Ala Asp Gly Asn Pro Pro Ala His
        260             265             270

Leu Ser Trp Phe Gln Gly Phe Pro Ala Leu Asn Ala Thr Pro Ile Ser
        275             280             285
```

92

```
Asn Thr Gly Val Leu Glu Leu Pro Gln Val Gly Ser Ala Glu Glu Gly
    290                 295             300

Asp Phe Thr Cys Arg Ala Gln His Pro Leu Gly Ser Leu Gln Ile Ser
305             310             315                 320

Leu Ser Leu Phe Val His Trp Lys Pro Glu Gly Arg Ala Gly Gly Val
                325             330             335

Leu Gly Ala Val Trp Gly Ala Ser Ile Thr Thr Leu Val Phe Leu Cys
                340             345             350

Val Cys Phe Ile Phe Arg Val Lys Thr Arg Arg Lys Lys Ala Ala Gln
    355             360             365

Pro Val Gln Asn Thr Asp Asp Val Asn Pro Val Met Val Ser Gly Ser
    370             375             380

Arg Gly His Gln His Gln Phe Gln Thr Gly Ile Val Ser Asp His Pro
385             390             395                 400

Ala Glu Ala Gly Pro Ile Ser Glu Asp Glu Gln Glu Leu His Tyr Ala
                405             410             415

Val Leu His Phe His Lys Val Gln Pro Gln Glu Pro Lys Val Thr Asp
                420             425             430

Thr Glu Tyr Ser Glu Ile Lys Ile His Lys
            435             440
```

<210> 56
<211> 626
<212> PRT
<213> Homo sapiens

<400> 56

```
Met Ile Phe Leu Thr Ala Leu Pro Leu Phe Trp Ile Met Ile Ser Ala
1               5                   10                  15

Ser Arg Gly Gly His Trp Gly Ala Trp Met Pro Ser Ser Ile Ser Ala
                20                  25                  30
```

```
Phe Glu Gly Thr Cys Val Ser Ile Pro Cys Arg Phe Asp Phe Pro Asp
        35              40              45

Glu Leu Arg Pro Ala Val Val His Gly Val Trp Tyr Phe Asn Ser Pro
    50              55              60

Tyr Pro Lys Asn Tyr Pro Pro Val Val Phe Lys Ser Arg Thr Gln Val
65              70              75              80

Val His Glu Ser Phe Gln Gly Arg Ser Arg Leu Leu Gly Asp Leu Gly
            85              90              95

Leu Arg Asn Cys Thr Leu Leu Leu Ser Asn Val Ser Pro Glu Leu Gly
            100             105             110

Gly Lys Tyr Tyr Phe Arg Gly Asp Leu Gly Gly Tyr Asn Gln Tyr Thr
        115             120             125

Phe Ser Glu His Ser Val Leu Asp Ile Val Asn Thr Pro Asn Ile Val
    130             135             140

Val Pro Pro Glu Val Val Ala Gly Thr Glu Val Glu Val Ser Cys Met
145             150             155             160

Val Pro Asp Asn Cys Pro Glu Leu Arg Pro Glu Leu Ser Trp Leu Gly
            165             170             175

His Glu Gly Leu Gly Glu Pro Ala Val Leu Gly Arg Leu Arg Glu Asp
        180             185             190

Glu Gly Thr Trp Val Gln Val Ser Leu Leu His Phe Val Pro Thr Arg
        195             200             205

Glu Ala Asn Gly His Arg Leu Gly Cys Gln Ala Ser Phe Pro Asn Thr
    210             215             220

Thr Leu Gln Phe Glu Gly Tyr Ala Ser Met Asp Val Lys Tyr Pro Pro
225             230             235             240

Val Ile Val Glu Met Asn Ser Ser Val Glu Ala Ile Glu Gly Ser His
            245             250             255
```

94

Val Ser Leu Leu Cys Gly Ala Asp Ser Asn Pro Pro Pro Leu Leu Thr
        260   265   270

Trp Met Arg Asp Gly Thr Val Leu Arg Glu Ala Val Ala Glu Ser Leu
        275   280   285

Leu Leu Glu Leu Glu Glu Val Thr Pro Ala Glu Asp Gly Val Tyr Ala
    290   295   300

Cys Leu Ala Glu Asn Ala Tyr Gly Gln Asp Asn Arg Thr Val Gly Leu
305   310   315   320

Ser Val Met Tyr Ala Pro Trp Lys Pro Thr Val Asn Gly Thr Met Val
        325   330   335

Ala Val Glu Gly Glu Thr Val Ser Ile Leu Cys Ser Thr Gln Ser Asn
        340   345   350

Pro Asp Pro Ile Leu Thr Ile Phe Lys Glu Lys Gln Ile Leu Ser Thr
        355   360   365

Val Ile Tyr Glu Ser Glu Leu Gln Leu Glu Leu Pro Ala Val Ser Pro
    370   375   380

Glu Asp Asp Gly Glu Tyr Trp Cys Val Ala Glu Asn Gln Tyr Gly Gln
385   390   395   400

Arg Ala Thr Ala Phe Asn Leu Ser Val Glu Phe Ala Pro Val Leu Leu
            405   410   415

Leu Glu Ser His Cys Ala Ala Ala Arg Asp Thr Val Gln Cys Leu Cys
            420   425   430

Val Val Lys Ser Asn Pro Glu Pro Ser Val Ala Phe Glu Leu Pro Ser
        435   440   445

Arg Asn Val Thr Val Asn Glu Ser Glu Arg Glu Phe Val Tyr Ser Glu
        450   455   460

Arg Ser Gly Leu Val Leu Thr Ser Ile Leu Thr Leu Arg Gly Gln Ala
465   470   475   480

Gln Ala Pro Pro Arg Val Ile Cys Thr Ala Arg Asn Leu Tyr Gly Ala
                485   490   495

Lys Ser Leu Glu Leu Pro Phe Gln Gly Ala His Arg Leu Met Trp Ala
                500   505   510

Lys Ile Gly Pro Val Gly Ala Val Val Ala Phe Ala Ile Leu Ile Ala
                515   520   525

Ile Val Cys Tyr Ile Thr Gln Thr Arg Arg Lys Lys Asn Val Thr Glu
    530   535   540

Ser Pro Ser Phe Ser Ala Gly Asp Asn Pro Pro Val Leu Phe Ser Ser
545   550   555   560

Asp Phe Arg Ile Ser Gly Ala Pro Glu Lys Tyr Glu Ser Glu Arg Arg
                565   570   575

Leu Gly Ser Glu Arg Arg Leu Leu Gly Leu Arg Gly Glu Pro Pro Glu
                580   585   590

Leu Asp Leu Ser Tyr Ser His Ser Asp Leu Gly Lys Arg Pro Thr Lys
                595   600   605

Asp Ser Tyr Thr Leu Thr Glu Glu Leu Ala Glu Tyr Ala Glu Ile Arg
    610   615   620

Val Lys
625

<210>   57
<211>   551
<212>   PRT
<213>   Homo sapiens

<400>   57

Met Leu Pro Leu Leu Leu Leu Pro Leu Leu Trp Gly Gly Ser Leu Gln
1   5   10   15

Glu Lys Pro Val Tyr Glu Leu Gln Val Gln Lys Ser Val Thr Val Gln
                20   25   30

96

```
Glu Gly Leu Cys Val Leu Val Pro Cys Ser Phe Ser Tyr Pro Trp Arg
        35              40              45

Ser Trp Tyr Ser Ser Pro Pro Leu Tyr Val Tyr Trp Phe Arg Asp Gly
        50              55              60

Glu Ile Pro Tyr Tyr Ala Glu Val Val Ala Thr Asn Asn Pro Asp Arg
65                  70              75              80

Arg Val Lys Pro Glu Thr Gln Gly Arg Phe Arg Leu Leu Gly Asp Val
                85              90              95

Gln Lys Lys Asn Cys Ser Leu Ser Ile Gly Asp Ala Arg Met Glu Asp
            100             105             110

Thr Gly Ser Tyr Phe Phe Arg Val Glu Arg Gly Arg Asp Val Lys Tyr
        115             120             125

Ser Tyr Gln Gln Asn Lys Leu Asn Leu Glu Val Thr Ala Leu Ile Glu
    130             135             140

Lys Pro Asp Ile His Phe Leu Glu Pro Leu Glu Ser Gly Arg Pro Thr
145             150             155             160

Arg Leu Ser Cys Ser Leu Pro Gly Ser Cys Glu Ala Gly Pro Pro Leu
            165             170             175

Thr Phe Ser Trp Thr Gly Asn Ala Leu Ser Pro Leu Asp Pro Glu Thr
            180             185             190

Thr Arg Ser Ser Glu Leu Thr Leu Thr Pro Arg Pro Glu Asp His Gly
        195             200             205

Thr Asn Leu Thr Cys Gln Met Lys Arg Gln Gly Ala Gln Val Thr Thr
    210             215             220

Glu Arg Thr Val Gln Leu Asn Val Ser Tyr Ala Pro Gln Thr Ile Thr
225             230             235             240

Ile Phe Arg Asn Gly Ile Ala Leu Glu Ile Leu Gln Asn Thr Ser Tyr
            245             250             255
```

Leu Pro Val Leu Glu Gly Gln Ala Leu Arg Leu Leu Cys Asp Ala Pro
            260   265   270

Ser Asn Pro Pro Ala His Leu Ser Trp Phe Gln Gly Ser Pro Ala Leu
            275   280   285

Asn Ala Thr Pro Ile Ser Asn Thr Gly Ile Leu Glu Leu Arg Arg Val
            290   295   300

Arg Ser Ala Glu Glu Gly Gly Phe Thr Cys Arg Ala Gln His Pro Leu
305   310   315   320

Gly Phe Leu Gln Ile Phe Leu Asn Leu Ser Val Tyr Ser Leu Pro Gln
            325   330   335

Leu Leu Gly Pro Ser Cys Ser Trp Glu Ala Glu Gly Leu His Cys Arg
            340   345   350

Cys Ser Phe Arg Ala Arg Pro Ala Pro Ser Leu Cys Trp Arg Leu Glu
            355   360   365

Glu Lys Pro Leu Glu Gly Asn Ser Ser Gln Gly Ser Phe Lys Val Asn
            370   375   380

Ser Ser Ser Ala Gly Pro Trp Ala Asn Ser Ser Leu Ile Leu His Gly
385   390   395   400

Gly Leu Ser Ser Asp Leu Lys Val Ser Cys Lys Ala Trp Asn Ile Tyr
            405   410   415

Gly Ser Gln Ser Gly Ser Val Leu Leu Leu Gln Gly Arg Ser Asn Leu
            420   425   430

Gly Thr Gly Val Val Pro Ala Ala Leu Gly Gly Ala Gly Val Met Ala
            435   440   445

Leu Leu Cys Ile Cys Leu Cys Leu Ile Phe Phe Leu Ile Val Lys Ala
            450   455   460

Arg Arg Lys Gln Ala Ala Gly Arg Pro Glu Lys Met Asp Asp Glu Asp
465   470   475   480

```
Pro Ile Met Gly Thr Ile Thr Ser Gly Ser Arg Lys Lys Pro Trp Pro
            485              490            495
```

```
Asp Ser Pro Gly Asp Gln Ala Ser Pro Pro Gly Asp Ala Pro Pro Leu
            500              505            510
```

```
Glu Glu Gln Lys Glu Leu His Tyr Ala Ser Leu Ser Phe Ser Glu Met
        515              520            525
```

```
Lys Ser Arg Glu Pro Lys Asp Gln Glu Ala Pro Ser Thr Thr Glu Tyr
    530              535            540
```

```
Ser Glu Ile Lys Thr Ser Lys
545              550
```

<210> 58
<211> 364
<212> PRT
<213> Homo sapiens

<400> 58

```
Met Pro Leu Leu Leu Leu Leu Pro Leu Leu Trp Ala Gly Ala Leu Ala
1                5                10              15
```

```
Met Asp Pro Asn Phe Trp Leu Gln Val Gln Glu Ser Val Thr Val Gln
            20              25              30
```

```
Glu Gly Leu Cys Val Leu Val Pro Cys Thr Phe Phe His Pro Ile Pro
        35              40              45
```

```
Tyr Tyr Asp Lys Asn Ser Pro Val His Gly Tyr Trp Phe Arg Glu Gly
    50              55              60
```

```
Ala Ile Ile Ser Gly Asp Ser Pro Val Ala Thr Asn Lys Leu Asp Gln
65              70              75              80
```

```
Glu Val Gln Glu Glu Thr Gln Gly Arg Phe Arg Leu Leu Gly Asp Pro
                85              90              95
```

```
Ser Arg Asn Asn Cys Ser Leu Ser Ile Val Asp Ala Arg Arg Arg Asp
            100             105             110
```

99

Asn Gly Ser Tyr Phe Phe Arg Met Glu Arg Gly Ser Thr Lys Tyr Ser
115   120   125

Tyr Lys Ser Pro Gln Leu Ser Val His Val Thr Asp Leu Thr His Arg
130   135   140

Pro Lys Ile Leu Ile Pro Gly Thr Leu Glu Pro Gly His Ser Lys Asn
145   150   155   160

Leu Thr Cys Ser Val Ser Trp Ala Cys Glu Gln Gly Thr Pro Pro Ile
165   170   175

Phe Ser Trp Leu Ser Ala Ala Pro Thr Ser Leu Gly Pro Arg Thr Thr
180   185   190

His Ser Ser Val Leu Ile Ile Thr Pro Arg Pro Gln Asp His Gly Thr
195   200   205

Asn Leu Thr Cys Gln Val Lys Phe Ala Gly Ala Gly Val Thr Thr Glu
210   215   220

Arg Thr Ile Gln Leu Asn Val Thr Tyr Val Pro Gln Asn Pro Thr Thr
225   230   235   240

Gly Ile Phe Pro Gly Asp Gly Ser Gly Lys Gln Glu Thr Arg Ala Gly
245   250   255

Leu Val His Gly Ala Ile Gly Gly Ala Gly Val Thr Ala Leu Leu Ala
260   265   270

Leu Cys Leu Cys Leu Ile Phe Phe Ile Val Lys Thr His Arg Arg Lys
275   280   285

Ala Ala Arg Thr Ala Val Gly Ser Asn Asp Thr His Pro Thr Thr Gly
290   295   300

Ser Ala Ser Pro Lys His Gln Lys Asn Ser Lys Leu His Gly Pro Thr
305   310   315   320

Glu Thr Ser Ser Cys Ser Gly Ala Ala Pro Thr Val Glu Met Asp Glu
325   330   335

100

```
Glu Leu His Tyr Ala Ser Leu Asn Phe His Gly Met Asn Pro Ser Lys
            340             345             350

Asp Thr Ser Thr Glu Tyr Ser Glu Val Arg Thr Gln
            355             360
```

<210> 59
<211> 467
<212> PRT
<213> Homo sapiens

<400> 59

```
Met Leu Leu Leu Leu Leu Pro Leu Leu Trp Gly Arg Glu Arg Val
1               5               10              15

Glu Gly Gln Lys Ser Asn Arg Lys Asp Tyr Ser Leu Thr Met Gln Ser
            20              25              30

Ser Val Thr Val Gln Glu Gly Met Cys Val His Val Arg Cys Ser Phe
            35              40              45

Ser Tyr Pro Val Asp Ser Gln Thr Asp Ser Asp Pro Val His Gly Tyr
            50              55              60

Trp Phe Arg Ala Gly Asn Asp Ile Ser Trp Lys Ala Pro Val Ala Thr
65              70              75              80

Asn Asn Pro Ala Trp Ala Val Gln Glu Glu Thr Arg Asp Arg Phe His
            85              90              95

Leu Leu Gly Asp Pro Gln Thr Lys Asn Cys Thr Leu Ser Ile Arg Asp
            100             105             110

Ala Arg Met Ser Asp Ala Gly Arg Tyr Phe Phe Arg Met Glu Lys Gly
            115             120             125

Asn Ile Lys Trp Asn Tyr Lys Tyr Asp Gln Leu Ser Val Asn Val Thr
            130             135             140

Ala Leu Thr His Arg Pro Asn Ile Leu Ile Pro Gly Thr Leu Glu Ser
145             150             155             160
```

101

```
Gly Cys Phe Gln Asn Leu Thr Cys Ser Val Pro Trp Ala Cys Glu Gln
             165                 170              175

Gly Thr Pro Pro Met Ile Ser Trp Met Gly Thr Ser Val Ser Pro Leu
             180                 185              190

His Pro Ser Thr Thr Arg Ser Ser Val Leu Thr Leu Ile Pro Gln Pro
             195                 200              205

Gln His His Gly Thr Ser Leu Thr Cys Gln Val Thr Leu Pro Gly Ala
    210                 215                 220

Gly Val Thr Thr Asn Arg Thr Ile Gln Leu Asn Val Ser Tyr Pro Pro
225                 230                 235                 240

Gln Asn Leu Thr Val Thr Val Phe Gln Gly Glu Gly Thr Ala Ser Thr
             245                 250                 255

Ala Leu Gly Asn Ser Ser Ser Leu Ser Val Leu Glu Gly Gln Ser Leu
             260                 265                 270

Arg Leu Val Cys Ala Val Asp Ser Asn Pro Pro Ala Arg Leu Ser Trp
             275                 280                 285

Thr Trp Arg Ser Leu Thr Leu Tyr Pro Ser Gln Pro Ser Asn Pro Leu
    290                 295                 300

Val Leu Glu Leu Gln Val His Leu Gly Asp Glu Gly Glu Phe Thr Cys
305                 310                 315                 320

Arg Ala Gln Asn Ser Leu Gly Ser Gln His Val Ser Leu Asn Leu Ser
             325                 330                 335

Leu Gln Gln Glu Tyr Thr Gly Lys Met Arg Pro Val Ser Gly Val Leu
             340                 345                 350

Leu Gly Ala Val Gly Gly Ala Gly Ala Thr Ala Leu Val Phe Leu Ser
             355                 360                 365

Phe Cys Val Ile Phe Ile Val Val Arg Ser Cys Arg Lys Lys Ser Ala
    370                 375                 380
```

102

Arg Pro Ala Ala Asp Val Gly Asp Ile Gly Met Lys Asp Ala Asn Thr
385   390   395   400

Ile Arg Gly Ser Ala Ser Gln Gly Asn Leu Thr Glu Ser Trp Ala Asp
            405   410   415

Asp Asn Pro Arg His His Gly Leu Ala Ala His Ser Ser Gly Glu Glu
            420   425   430

Arg Glu Ile Gln Tyr Ala Pro Leu Ser Phe His Lys Gly Glu Pro Gln
            435   440   445

Asp Leu Ser Gly Gln Glu Ala Thr Asn Asn Glu Tyr Ser Glu Ile Lys
    450   455   460

Ile Pro Lys
465

<210> 60
<211> 524
<212> PRT
<213> Homo sapiens

<400> 60

Met Tyr Ala Leu Phe Leu Leu Ala Ser Leu Leu Gly Ala Ala Leu Ala
1   5   10   15

Gly Pro Val Leu Gly Leu Lys Glu Cys Thr Arg Gly Ser Ala Val Trp
            20   25   30

Cys Gln Asn Val Lys Thr Ala Ser Asp Cys Gly Ala Val Lys His Cys
            35   40   45

Leu Gln Thr Val Trp Asn Lys Pro Thr Val Lys Ser Leu Pro Cys Asp
    50   55   60

Ile Cys Lys Asp Val Val Thr Ala Ala Gly Asp Met Leu Lys Asp Asn
65   70   75   80

Ala Thr Glu Glu Glu Ile Leu Val Tyr Leu Glu Lys Thr Cys Asp Trp
            85   90   95

103

Leu Pro Lys Pro Asn Met Ser Ala Ser Cys Lys Glu Ile Val Asp Ser
        100   105   110

Tyr Leu Pro Val Ile Leu Asp Ile Ile Lys Gly Glu Met Ser Arg Pro
        115   120   125

Gly Glu Val Cys Ser Ala Leu Asn Leu Cys Glu Ser Leu Gln Lys His
        130   135   140

Leu Ala Glu Leu Asn His Gln Lys Gln Leu Glu Ser Asn Lys Ile Pro
145   150   155   160

Glu Leu Asp Met Thr Glu Val Val Ala Pro Phe Met Ala Asn Ile Pro
            165   170   175

Leu Leu Leu Tyr Pro Gln Asp Gly Pro Arg Ser Lys Pro Gln Pro Lys
          180   185   190

Asp Asn Gly Asp Val Cys Gln Asp Cys Ile Gln Met Val Thr Asp Ile
        195   200   205

Gln Thr Ala Val Arg Thr Asn Ser Thr Phe Val Gln Ala Leu Val Glu
        210   215   220

His Val Lys Glu Glu Cys Asp Arg Leu Gly Pro Gly Met Ala Asp Ile
225   230   235   240

Cys Lys Asn Tyr Ile Ser Gln Tyr Ser Glu Ile Ala Ile Gln Met Met
          245   250   255

Met His Met Gln Pro Lys Glu Ile Cys Ala Leu Val Gly Phe Cys Asp
          260   265   270

Glu Val Lys Glu Met Pro Met Gln Thr Leu Val Pro Ala Lys Val Ala
        275   280   285

Ser Lys Asn Val Ile Pro Ala Leu Glu Leu Val Glu Pro Ile Lys Lys
        290   295   300

His Glu Val Pro Ala Lys Ser Asp Val Tyr Cys Glu Val Cys Glu Phe
305   310   315   320

104

Leu Val Lys Glu Val Thr Lys Leu Ile Asp Asn Asn Lys Thr Glu Lys
            325   330   335

Glu Ile Leu Asp Ala Phe Asp Lys Met Cys Ser Lys Leu Pro Lys Ser
            340   345   350

Leu Ser Glu Glu Cys Gln Glu Val Val Asp Thr Tyr Gly Ser Ser Ile
            355   360   365

Leu Ser Ile Leu Leu Glu Glu Val Ser Pro Glu Leu Val Cys Ser Met
    370   375   380

Leu His Leu Cys Ser Gly Thr Arg Leu Pro Ala Leu Thr Val His Val
385   390   395   400

Thr Gln Pro Lys Asp Gly Gly Phe Cys Glu Val Cys Lys Lys Leu Val
            405   410   415

Gly Tyr Leu Asp Arg Asn Leu Glu Lys Asn Ser Thr Lys Gln Glu Ile
            420   425   430

Leu Ala Ala Leu Glu Lys Gly Cys Ser Phe Leu Pro Asp Pro Tyr Gln
            435   440   445

Lys Gln Cys Asp Gln Phe Val Ala Glu Tyr Glu Pro Val Leu Ile Glu
    450   455   460

Ile Leu Val Glu Val Met Asp Pro Ser Phe Val Cys Leu Lys Ile Gly
465   470   475   480

Ala Cys Pro Ser Ala His Lys Pro Leu Leu Gly Thr Glu Lys Cys Ile
            485   490   495

Trp Gly Pro Ser Tyr Trp Cys Gln Asn Thr Glu Thr Ala Ala Gln Cys
            500   505   510

Asn Ala Val Glu His Cys Lys Arg His Val Trp Asn
            515   520

105

<210> 61
<211> 527
<212> PRT
<213> Homo sapiens

<400> 61

```
Met Tyr Ala Leu Phe Leu Leu Ala Ser Leu Leu Gly Ala Ala Leu Ala
1               5                   10                  15


Gly Pro Val Leu Gly Leu Lys Glu Cys Thr Arg Gly Ser Ala Val Trp
            20                  25                  30


Cys Gln Asn Val Lys Thr Ala Ser Asp Cys Gly Ala Val Lys His Cys
            35                  40                  45


Leu Gln Thr Val Trp Asn Lys Pro Thr Val Lys Ser Leu Pro Cys Asp
        50                  55                  60


Ile Cys Lys Asp Val Val Thr Ala Ala Gly Asp Met Leu Lys Asp Asn
65                  70                  75                  80


Ala Thr Glu Glu Glu Ile Leu Val Tyr Leu Glu Lys Thr Cys Asp Trp
                85                  90                  95


Leu Pro Lys Pro Asn Met Ser Ala Ser Cys Lys Glu Ile Val Asp Ser
            100                 105                 110


Tyr Leu Pro Val Ile Leu Asp Ile Ile Lys Gly Glu Met Ser Arg Pro
            115                 120                 125


Gly Glu Val Cys Ser Ala Leu Asn Leu Cys Glu Ser Leu Gln Lys His
        130                 135                 140


Leu Ala Glu Leu Asn His Gln Lys Gln Leu Glu Ser Asn Lys Ile Pro
145                 150                 155                 160


Glu Leu Asp Met Thr Glu Val Val Ala Pro Phe Met Ala Asn Ile Pro
                165                 170                 175


Leu Leu Leu Tyr Pro Gln Asp Gly Pro Arg Ser Lys Pro Gln Pro Lys
            180                 185                 190
```

```
Asp Asn Gly Asp Val Cys Gln Asp Cys Ile Gln Met Val Thr Asp Ile
        195                 200                 205

Gln Thr Ala Val Arg Thr Asn Ser Thr Phe Val Gln Ala Leu Val Glu
        210                 215                 220

His Val Lys Glu Glu Cys Asp Arg Leu Gly Pro Gly Met Ala Asp Ile
    225                 230                 235                 240

Cys Lys Asn Tyr Ile Ser Gln Tyr Ser Glu Ile Ala Ile Gln Met Met
                245                 250                 255

Met His Met Gln Asp Gln Gln Pro Lys Glu Ile Cys Ala Leu Val Gly
            260                 265                 270

Phe Cys Asp Glu Val Lys Glu Met Pro Met Gln Thr Leu Val Pro Ala
        275                 280                 285

Lys Val Ala Ser Lys Asn Val Ile Pro Ala Leu Glu Leu Val Glu Pro
    290                 295                 300

Ile Lys Lys His Glu Val Pro Ala Lys Ser Asp Val Tyr Cys Glu Val
305                 310                 315                 320

Cys Glu Phe Leu Val Lys Glu Val Thr Lys Leu Ile Asp Asn Asn Lys
            325                 330                 335

Thr Glu Lys Glu Ile Leu Asp Ala Phe Asp Lys Met Cys Ser Lys Leu
        340                 345                 350

Pro Lys Ser Leu Ser Glu Glu Cys Gln Glu Val Val Asp Thr Tyr Gly
        355                 360                 365

Ser Ser Ile Leu Ser Ile Leu Leu Glu Glu Val Ser Pro Glu Leu Val
    370                 375                 380

Cys Ser Met Leu His Leu Cys Ser Gly Thr Arg Leu Pro Ala Leu Thr
385                 390                 395                 400

Val His Val Thr Gln Pro Lys Asp Gly Gly Phe Cys Glu Val Cys Lys
                405                 410                 415
```

107

```
Lys Leu Val Gly Tyr Leu Asp Arg Asn Leu Glu Lys Asn Ser Thr Lys
            420                 425                 430

Gln Glu Ile Leu Ala Ala Leu Glu Lys Gly Cys Ser Phe Leu Pro Asp
            435                 440                 445

Pro Tyr Gln Lys Gln Cys Asp Gln Phe Val Ala Glu Tyr Glu Pro Val
    450                 455                 460

Leu Ile Glu Ile Leu Val Glu Val Met Asp Pro Ser Phe Val Cys Leu
465                 470                 475                 480

Lys Ile Gly Ala Cys Pro Ser Ala His Lys Pro Leu Leu Gly Thr Glu
                485                 490                 495

Lys Cys Ile Trp Gly Pro Ser Tyr Trp Cys Gln Asn Thr Glu Thr Ala
            500                 505                 510

Ala Gln Cys Asn Ala Val Glu His Cys Lys Arg His Val Trp Asn
            515                 520                 525
```

<210> 62
<211> 208
<212> PRT
<213> Sus scrofa

<400> 62

```
Ala Leu Leu Ala Glu His Leu Leu Lys Pro Leu Pro Ala Asp Lys Gln
1               5               10                  15

Ile Glu Thr Gly Pro Phe Leu Glu Ala Val Ser His Leu Pro Pro Phe
            20              25                  30

Phe Asp Cys Leu Gly Ser Pro Val Phe Thr Pro Ile Lys Ala Asp Ile
            35              40                  45

Ser Gly Asn Ile Thr Lys Ile Lys Ala Val Tyr Asp Thr Asn Pro Ala
    50                  55                  60

Lys Phe Arg Thr Leu Gln Asn Ile Leu Glu Val Glu Lys Glu Met Tyr
65                  70                  75                  80
```

```
Gly Ala Glu Trp Pro Lys Val Gly Ala Thr Leu Ala Leu Met Trp Leu
                85                  90                  95


Lys Arg Gly Leu Arg Phe Ile Gln Val Phe Leu Gln Ser Ile Cys Asp
            100                 105                 110


Gly Glu Arg Asp Glu Asn His Pro Asn Leu Ile Arg Val Asn Ala Thr
            115             120                 125


Lys Ala Tyr Glu Met Ala Leu Lys Lys Tyr His Gly Trp Ile Val Gln
    130             135             140


Lys Ile Phe Gln Ala Ala Leu Tyr Ala Ala Pro Tyr Lys Ser Asp Phe
145             150             155             160


Leu Lys Ala Leu Ser Lys Gly Gln Asn Val Thr Glu Glu Glu Cys Leu
            165             170             175


Glu Lys Val Arg Leu Phe Leu Val Asn Tyr Thr Ala Thr Ile Asp Val
            180             185             190


Ile Tyr Glu Met Tyr Thr Lys Met Asn Ala Glu Leu Asn Tyr Lys Val
        195             200             205
```

<210> 63
<211> 209
<212> PRT
<213> Homo sapiens

<400> 63

```
Met Ala Leu Leu Ala Glu His Leu Leu Lys Pro Leu Pro Ala Asp Lys
1               5               10                  15


Gln Ile Glu Thr Gly Pro Phe Leu Glu Ala Val Ser His Leu Pro Pro
            20              25                  30


Phe Phe Asp Cys Leu Gly Ser Pro Val Phe Thr Pro Ile Lys Ala Asp
        35              40                  45


Ile Ser Gly Asn Ile Thr Lys Ile Lys Ala Val Tyr Asp Thr Asn Pro
    50              55                  60
```

109

```
Ala Lys Phe Arg Thr Leu Gln Asn Ile Leu Glu Val Glu Lys Glu Met
65              70              75              80


Tyr Gly Ala Glu Trp Pro Lys Val Gly Ala Thr Leu Ala Leu Met Trp
                85              90              95


Leu Lys Arg Gly Leu Arg Phe Ile Gln Val Phe Leu Gln Ser Ile Cys
            100             105             110


Asp Gly Glu Arg Asp Glu Asn His Pro Asn Leu Ile Arg Val Asn Ala
        115             120             125


Thr Lys Ala Tyr Glu Met Ala Leu Lys Lys Tyr His Gly Trp Ile Val
    130             135             140


Gln Lys Ile Phe Gln Ala Ala Leu Tyr Ala Ala Pro Tyr Lys Ser Asp
145             150             155             160


Phe Leu Lys Ala Leu Ser Lys Gly Gln Asn Val Thr Glu Glu Glu Cys
            165             170             175


Leu Glu Lys Ile Arg Leu Phe Leu Val Asn Tyr Thr Ala Thr Ile Asp
            180             185             190


Val Ile Tyr Glu Met Tyr Thr Gln Met Asn Ala Glu Leu Asn Tyr Lys
        195             200             205


Val
```

```
<210>   64
<211>   276
<212>   'PRT
<213>   Homo sapiens

<400>   64
```

```
Met Gly Asn Ser Met Lys Ser Thr Pro Ala Pro Ala Glu Arg Pro Leu
1               5               10              15


Pro Asn Pro Glu Gly Leu Asp Ser Asp Phe Leu Ala Val Leu Ser Asp
            20              25              30
```

110

```
Tyr Pro Ser Pro Asp Ile Ser Pro Pro Ile Phe Arg Arg Gly Glu Lys
        35                  40                  45

Leu Arg Val Ile Ser Asp Glu Gly Gly Trp Trp Lys Ala Ile Ser Leu
        50                  55                  60

Ser Thr Gly Arg Glu Ser Tyr Ile Pro Gly Ile Cys Val Ala Arg Val
65                      70                  75                  80

Tyr His Gly Trp Leu Phe Glu Gly Leu Gly Arg Asp Lys Ala Glu Glu
                85                  90                  95

Leu Leu Gln Leu Pro Asp Thr Lys Val Gly Ser Phe Met Ile Arg Glu
            100                 105                 110

Ser Glu Thr Lys Lys Gly Phe Tyr Ser Leu Ser Val Arg His Arg Gln
        115                 120                 125

Val Lys His Tyr Arg Ile Phe Arg Leu Pro Asn Asn Trp Tyr Tyr Ile
    130                 135                 140

Ser Pro Arg Leu Thr Phe Gln Cys Leu Glu Asp Leu Val Asn His Tyr
145                 150                 155                 160

Ser Glu Val Ala Asp Gly Leu Cys Cys Val Leu Thr Thr Pro Cys Leu
            165                 170                 175

Thr Gln Ser Thr Ala Ala Pro Ala Val Arg Ala Ser Ser Ser Pro Val
            180                 185                 190

Thr Leu Arg Gln Lys Thr Val Asp Trp Arg Arg Val Ser Arg Leu Gln
        195                 200                 205

Glu Asp Pro Glu Gly Thr Glu Asn Pro Leu Gly Val Asp Glu Ser Leu
    210                 215                 220

Phe Ser Tyr Gly Leu Arg Glu Ser Ile Ala Ser Tyr Leu Ser Leu Thr
225                 230                 235                 240

Ser Glu Asp Asn Thr Ser Phe Asp Arg Lys Lys Lys Ser Ile Ser Leu
            245                 250                 255
```

111

Met Tyr Gly Gly Ser Lys Arg Lys Ser Ser Phe Phe Ser Ser Pro Pro
            260   265   270

Tyr Phe Glu Asp
            275

<210> 65
<211> 18
<212> PRT
<213> Homo sapiens

<400> 65

Lys Arg Phe Lys Gln Asp Gly Gly Trp Ser His Trp Ser Pro Trp Ser
1   5   10   15

Ser Cys

<210> 66
<211> 18
<212> PRT
<213> Homo sapiens

<400> 66

Lys Arg Ala Lys Ala Ala Gly Gly Trp Ser His Trp Ser Pro Trp Ser
1   5   10   15

Ser Cys

<210> 67
<211> 1784
<212> DNA
<213> Staphylococcus aureus

<220>
<221> CDS
<222> (184)..(1635)
<223>

<400> 67
tcgaaatagc gtgattttgc ggttttaagc cttttacttc ctgaataaat ctttcagcaa   60

aatatttatt ttataagttg taaaacttac ctttaaattt aattataaat atagatttta   120

gtattgcaat acataattcg ttatattatg atgactatac aaatacatac aggggggtatt   180

112

```
aat ttg aaa aag aaa aac att tat tca att cgt aaa cta ggt gta ggt        228
Leu Lys Lys Lys Asn Ile Tyr Ser Ile Arg Lys Leu Gly Val Gly
1               5               10              15

att gca tct gta act tta ggt aca tta ctt ata tct ggt ggc gta aca        276
Ile Ala Ser Val Thr Leu Gly Thr Leu Leu Ile Ser Gly Gly Val Thr
            20              25              30

cct gct gca aat gct gcg caa cac gat gaa gct caa caa aat gct ttt        324
Pro Ala Ala Asn Ala Ala Gln His Asp Glu Ala Gln Gln Asn Ala Phe
        35              40              45

tat caa gtc tta aat atg cct aac tta aat gct gat caa cgc aat ggt        372
Tyr Gln Val Leu Asn Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly
            50              55              60

ttt atc caa agc ctt aaa gat gat cca agc caa agt gct aac gtt tta        420
Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Val Leu
        65              70              75

ggt gaa gct caa aaa ctt aat gac tct caa gct cca aaa gct gat gcg        468
Gly Glu Ala Gln Lys Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala
80              85              90              95

caa caa aat aac ttc gac aaa gat caa caa agc gcc ttc tat gaa atc        516
Gln Gln Asn Asn Phe Asp Lys Asp Gln Gln Ser Ala Phe Tyr Glu Ile
                100             105             110

ttg aac atg cct aac tta aac gaa gcg caa cgt aac ggc ttc att caa        564
Leu Asn Met Pro Asn Leu Asn Glu Ala Gln Arg Asn Gly Phe Ile Gln
                115             120             125

agt ctt aaa gac gac cca agc caa agc act aac gtt tta ggt gaa gct        612
Ser Leu Lys Asp Asp Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala
            130             135             140

aaa aaa tta aac gaa tct caa gca ccg aaa gct gat aac aat ttc aac        660
Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala Asp Asn Asn Phe Asn
        145             150             155

aaa gaa caa caa aat gct ttc tat gaa atc ttg aat atg cct aac tta        708
Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu
160             165             170             175

aac gaa gaa caa cgc aat ggt ttc atc caa agc tta aaa gat gac cca        756
Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro
                180             185             190

agc caa agt gct aac cta ttg tca gaa gct aaa aag tta aat gaa tct        804
Ser Gln Ser Ala Asn Leu Leu Ser Glu Ala Lys Lys Leu Asn Glu Ser
            195             200             205

caa gca ccg aaa gcg gat aac aaa ttc aac aaa gaa caa caa aat gct        852
Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala
        210             215             220
```

113

ttc tat gaa atc tta cat tta cct aac tta aac gaa gaa caa cgc aat   900
Phe Tyr Glu Ile Leu His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn
    225   230   235

ggt ttc atc caa agc cta aaa gat gac cca agc caa agc gct aac ctt   948
Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu
240   245   250   255

tta gca gaa gct aaa aag cta aat gat gct caa gca cca aaa gct gac   996
Leu Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala Asp
                260   265   270

aac aaa ttc aac aaa gaa caa caa aat gct ttc tat gaa att tta cat   1044
Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His
            275   280   285

tta cct aac tta act gaa gaa caa cgt aac ggc ttc atc caa agc ctt   1092
Leu Pro Asn Leu Thr Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu
        290   295   300

aaa gac gat cct tcg gtg agc aaa gaa att tta gca gaa gct aaa aag   1140
Lys Asp Asp Pro Ser Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys
    305   310   315

cta aac gat gct caa gca cca aaa gag gaa gac aat aac aag cct ggc   1188
Leu Asn Asp Ala Gln Ala Pro Lys Glu Glu Asp Asn Asn Lys Pro Gly
320   325   330   335

aaa gaa gac aat aac aag cct ggc aaa gaa gac aat aac aag cct ggc   1236
Lys Glu Asp Asn Asn Lys Pro Gly Lys Glu Asp Asn Asn Lys Pro Gly
            340   345   350

aaa gaa gac aac aac aag cct ggc aaa gaa gac aac aac aag cct ggt   1284
Lys Glu Asp Asn Asn Lys Pro Gly Lys Glu Asp Asn Asn Lys Pro Gly
            355   360   365

aaa gaa gac aac aac aag cct ggc aaa gaa gac ggc aac aag cct ggt   1332
Lys Glu Asp Asn Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly
    370   375   380

aaa gaa gac aac aaa aaa cct ggt aaa gaa gat ggc aac aag cct ggt   1380
Lys Glu Asp Asn Lys Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly
    385   390   395

aaa gaa gac aac aaa aaa cct ggt aaa gaa gac ggc aac aag cct ggc   1428
Lys Glu Asp Asn Lys Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly
400   405   410   415

aaa gaa gat ggc aac aaa cct ggt aaa gaa gat ggt aac gga gta cat   1476
Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Gly Val His
            420   425   430

gtc gtt aaa ctt ggt gat aca gta aat gac att gca aaa gca aac ggc   1524
Val Val Lys Leu Gly Asp Thr Val Asn Asp Ile Ala Lys Ala Asn Gly
        435   440   445

114

```
act act gct gac aaa att gct gca gat aac aaa ttg gct gat aaa aac        1572
Thr Thr Ala Asp Lys Ile Ala Ala Asp Asn Lys Leu Ala Asp Lys Asn
        450             455             460

atg atc aaa ctt ggt caa gaa ctt gtt gtt gat aag aag caa cca caa        1620
Met Ile Lys Leu Gly Gln Glu Leu Val Val Asp Lys Lys Gln Pro Gln
        465             470             475

acc atg cag agc taa caaagctcaa gcattatcag aaactggcga agaaaatcca        1675
Thr Met Gln Ser
480

ttcatcggta caactgtatt tggtggatta tcattagcct taggtgcagc gttattagct        1735

ggacgtcgtc gcgaactata aaaacaaaca atacacaacg atagatatc                   1784
```

```
<210>  68
<211>  483
<212>  PRT
<213>  Staphylococcus aureus

<400>  68

Leu Lys Lys Lys Asn Ile Tyr Ser Ile Arg Lys Leu Gly Val Gly Ile
1               5                   10                  15


Ala Ser Val Thr Leu Gly Thr Leu Leu Ile Ser Gly Gly Val Thr Pro
                20                  25                  30


Ala Ala Asn Ala Ala Gln His Asp Glu Ala Gln Gln Asn Ala Phe Tyr
                35                  40                  45


Gln Val Leu Asn Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe
        50                  55                  60


Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Val Leu Gly
65                  70                  75                  80


Glu Ala Gln Lys Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Gln
                85                  90                  95


Gln Asn Asn Phe Asp Lys Asp Gln Gln Ser Ala Phe Tyr Glu Ile Leu
                100                 105                 110


Asn Met Pro Asn Leu Asn Glu Ala Gln Arg Asn Gly Phe Ile Gln Ser
        115                 120                 125
```

115

Leu Lys Asp Asp Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala Lys
    130   135   140

Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala Asp Asn Asn Phe Asn Lys
145   150   155   160

Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn
                165   170   175

Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser
            180   185   190

Gln Ser Ala Asn Leu Leu Ser Glu Ala Lys Lys Leu Asn Glu Ser Gln
        195   200   205

Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe
    210   215   220

Tyr Glu Ile Leu His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly
225   230   235   240

Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu
                245   250   255

Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala Asp Asn
            260   265   270

Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His Leu
    275   280   285

Pro Asn Leu Thr Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys
    290   295   300

Asp Asp Pro Ser Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys Leu
305   310   315   320

Asn Asp Ala Gln Ala Pro Lys Glu Glu Asp Asn Asn Lys Pro Gly Lys
                325   330   335

Glu Asp Asn Asn Lys Pro Gly Lys Glu Asp Asn Asn Lys Pro Gly Lys
            340   345   350

116

```
Glu Asp Asn Asn Lys Pro Gly Lys Glu Asp Asn Asn Lys Pro Gly Lys
        355                 360                 365

Glu Asp Asn Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys
        370                 375                 380

Glu Asp Asn Lys Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys
385                     390                 395                 400

Glu Asp Asn Lys Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys
                405                 410                 415

Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Gly Val His Val
            420                 425                 430

Val Lys Leu Gly Asp Thr Val Asn Asp Ile Ala Lys Ala Asn Gly Thr
        435                 440                 445

Thr Ala Asp Lys Ile Ala Ala Asp Asn Lys Leu Ala Asp Lys Asn Met
    450                 455                 460

Ile Lys Leu Gly Gln Glu Leu Val Val Asp Lys Lys Gln Pro Gln Thr
465                 470                 475                 480

Met Gln Ser
```

<210> 69
<211> 279
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(279)
<223>

<400> 69

```
gtg aag ccc aag gcc tgg ctg tcc cgt ggc ccc agt cct ggc cct ggc      48
Val Lys Pro Lys Ala Trp Leu Ser Arg Gly Pro Ser Pro Gly Pro Gly
1               5                   10                  15

cgt ctg ctg ctg gtg tgc cat gtc tca gga ttc tac cca aag cct gta      96
Arg Leu Leu Leu Val Cys His Val Ser Gly Phe Tyr Pro Lys Pro Val
            20                  25                  30
```

117

```
tgg gtg aag tgg atg cgg ggt gag cag gag cag cag ggc act cag cca      144
Trp Val Lys Trp Met Arg Gly Glu Gln Glu Gln Gln Gly Thr Gln Pro
        35              40                  45

ggg gac atc ctg ccc aat gct gac gag aca tgg tat ctc cga gca acc      192
Gly Asp Ile Leu Pro Asn Ala Asp Glu Thr Trp Tyr Leu Arg Ala Thr
    50              55                  60

ctg gat gtg gtg gct ggg gag gca gct ggc ctg tcc tgt cgg gtg aag      240
Leu Asp Val Val Ala Gly Glu Ala Ala Gly Leu Ser Cys Arg Val Lys
65              70                  75                  80

cac agc agt cta gag ggc cag gac atc gtc ctc tac tgg                  279
His Ser Ser Leu Glu Gly Gln Asp Ile Val Leu Tyr Trp
                85                  90
```

<210> 70
<211> 93
<212> PRT
<213> Homo sapiens

<400> 70

```
Val Lys Pro Lys Ala Trp Leu Ser Arg Gly Pro Ser Pro Gly Pro Gly
1               5               10                  15

Arg Leu Leu Leu Val Cys His Val Ser Gly Phe Tyr Pro Lys Pro Val
            20                  25                  30

Trp Val Lys Trp Met Arg Gly Glu Gln Glu Gln Gln Gly Thr Gln Pro
        35              40                  45

Gly Asp Ile Leu Pro Asn Ala Asp Glu Thr Trp Tyr Leu Arg Ala Thr
    50              55                  60

Leu Asp Val Val Ala Gly Glu Ala Ala Gly Leu Ser Cys Arg Val Lys
65              70                  75                  80

His Ser Ser Leu Glu Gly Gln Asp Ile Val Leu Tyr Trp
                85                  90
```

<210> 71
<211> 1873
<212> DNA
<213> Mus musculus

```
<220>
<221>  CDS
<222>  (173)..(175)
<223>


<220>
<221>  CDS
<222>  (273)..(314)
<223>


<220>
<221>  CDS
<222>  (315)..(1367)
<223>


<400>  71
aggaagggac agggtgacac cccaggatta cataaattta caggggctgc cgaattggtc      60

gaacaagccc gtggaacctg gaagccagag aacaccatcg ctgtaaagga aagaaactga     120

agcttttctc ggagcctatc tgggctgctc aaactttcag aatctaccga cc atg        175
                                                            Met
                                                             1

gtgagtcaga cagactgtct tggggtggaa ctggagccaa cctgaggaat ctcagggtcc     235

tggcaggagt ctccctgtcc ccctactttc tcctcag gag cgt gtg ctt ggc ttg     290
                                        Glu Arg Val Leu Gly Leu
                                                          5

ttg ctg ttg ctt ctg gtg cac gcc tct ccc gcc cca cca gag ccc tgc     338
Leu Leu Leu Leu Leu Val His Ala Ser Pro Ala Pro Pro Glu Pro Cys
         10               15               20

gag cta gac gag gaa agt tgc tcc tgc aac ttc tca gat ccg aag cca     386
Glu Leu Asp Glu Glu Ser Cys Ser Cys Asn Phe Ser Asp Pro Lys Pro
     25               30               35

gat tgg tcc agc gct ttc aat tgt ttg ggg gcg gca gat gtg gaa ttg     434
Asp Trp Ser Ser Ala Phe Asn Cys Leu Gly Ala Ala Asp Val Glu Leu
40               45               50               55

tac ggc' ggc ggc cgc agc ctg gaa tac ctt cta aag cgt gtg gac acg     482
Tyr Gly Gly Gly Arg Ser Leu Glu Tyr Leu Leu Lys Arg Val Asp Thr
             60               65               70

gaa gca gat ctg ggg cag ttc act gat att atc aag tct ctg tcc tta     530
Glu Ala Asp Leu Gly Gln Phe Thr Asp Ile Ile Lys Ser Leu Ser Leu
         75               80               85

aag cgg ctt acg gtg cgg gcc gcg cgg att cct agt cgg att cta ttc     578
Lys Arg Leu Thr Val Arg Ala Ala Arg Ile Pro Ser Arg Ile Leu Phe
         90               95               100
```

119

```
gga gcc ctg cgt gtg ctc ggg att tcc ggc ctc cag gaa ctg act ctt      626
Gly Ala Leu Arg Val Leu Gly Ile Ser Gly Leu Gln Glu Leu Thr Leu
    105                 110             115

gaa aat ctc gag gta acc ggc acc gcg ccg cca ccg ctt ctg gaa gcc      674
Glu Asn Leu Glu Val Thr Gly Thr Ala Pro Pro Pro Leu Leu Glu Ala
120                 125             130                     135

acc gga ccc gat ctc aac atc ttg aac ctc cgc aac gtg tcg tgg gca      722
Thr Gly Pro Asp Leu Asn Ile Leu Asn Leu Arg Asn Val Ser Trp Ala
            140             145                 150

aca agg gat gcc tgg ctc gca gaa ctg cag cag tgg cta aag cct gga      770
Thr Arg Asp Ala Trp Leu Ala Glu Leu Gln Gln Trp Leu Lys Pro Gly
            155                 160             165

ctc aag gta ctg agt att gcc caa gca cac tca ctc aac ttt tcc tgc      818
Leu Lys Val Leu Ser Ile Ala Gln Ala His Ser Leu Asn Phe Ser Cys
        170                 175             180

gaa cag gtc cgc gtc ttc cct gcc ctc tcc acc tta gac ctg tct gac      866
Glu Gln Val Arg Val Phe Pro Ala Leu Ser Thr Leu Asp Leu Ser Asp
    185                 190             195

aat cct gaa ttg ggc gag aga gga ctg atc tca gcc ctc tgt ccc ctc      914
Asn Pro Glu Leu Gly Glu Arg Gly Leu Ile Ser Ala Leu Cys Pro Leu
200                 205             210                 215

aag ttc ccg acc ctc caa gtt tta gcg ctg cgt aac gcg ggg atg gag      962
Lys Phe Pro Thr Leu Gln Val Leu Ala Leu Arg Asn Ala Gly Met Glu
                220             225             230

acg ccc agc ggc gtg tgc tct gcg ctg gcc gca gca agg gta cag ctg     1010
Thr Pro Ser Gly Val Cys Ser Ala Leu Ala Ala Ala Arg Val Gln Leu
            235             240             245

caa gga cta gac ctt agt cac aat tca ctg cgg gat gct gca ggc gct     1058
Gln Gly Leu Asp Leu Ser His Asn Ser Leu Arg Asp Ala Ala Gly Ala
        250             255             260

ccg agt tgt gac tgg ccc agt cag cta aac tcg ctc aat ctg tct ttc     1106
Pro Ser Cys Asp Trp Pro Ser Gln Leu Asn Ser Leu Asn Leu Ser Phe
    265             270             275

act ggg ctg aag cag gta cct aaa ggg ctg cca gcc aag ctc agc gtg     1154
Thr Gly Leu Lys Gln Val Pro Lys Gly Leu Pro Ala Lys Leu Ser Val
280             285             290                 295

ctg gat ctc agt tac aac agg ctg gat agg aac cct agc cca gat gag     1202
Leu Asp Leu Ser Tyr Asn Arg Leu Asp Arg Asn Pro Ser Pro Asp Glu
            300             305             310

ctg ccc caa gtg ggg aac ctg tca ctt aaa gga aat ccc ttt ttg gac     1250
Leu Pro Gln Val Gly Asn Leu Ser Leu Lys Gly Asn Pro Phe Leu Asp
        315             320             325
```

120

```
tct gaa tcc cac tcg gag aag ttt aac tct ggc gta gtc acc gcc gga    1298
Ser Glu Ser His Ser Glu Lys Phe Asn Ser Gly Val Val Thr Ala Gly
        330                 335                 340

gct cca tca tcc caa gca gtg gcc ttg tca gga act ctg gct ttg ctc    1346
Ala Pro Ser Ser Gln Ala Val Ala Leu Ser Gly Thr Leu Ala Leu Leu
        345                 350                 355

cta gga gat cgc ctc ttt gtt taaggaacat ttgcatcctc ctggtttctg       1397
Leu Gly Asp Arg Leu Phe Val
360                 365

agggtcctcg tcaacgaatc ctctgcttta aatttattaa aatcttaatc cacgatgtaa    1457

ggaaagaaag gcagtcaaga tggttcagtg ggtaaaagcc agcaaacttg acccctgatt    1517

ttaaccctca ggatccacac ggaaggggaa aactcactcc tgaaagttgt ccatctgtgc    1577

tcacaaataa atattttta aaataacaat gtgtttgttg gttttgtttt tgtttgggtt    1637

ttgttgtggt tttgtttgtt ttgtttttgtt tttgagacag tctggctatg tatccttggc    1697

tggcctcaaa ctcataaaga tcaagatcgg cctgcctcta cctccaaatg ctctggttaa    1757

agggatgtgc ctccatgccc agttgaagtc atcctgaacc acgagtccag gccactcact    1817

ctttactaag atctttacta agtatctgcc ataggtcagg ctcagtgcta aatgag        1873
```

<210> 72
<211> 366
<212> PRT
<213> Mus musculus

<400> 72

```
Met Glu Arg Val Leu Gly Leu Leu Leu Leu Leu Val His Ala Ser
1               5                 10                15


Pro Ala Pro Pro Glu Pro Cys Glu Leu Asp Glu Glu Ser Cys Ser Cys
            20                25                30


Asn Phe Ser Asp Pro Lys Pro Asp Trp Ser Ser Ala Phe Asn Cys Leu
        35                40                45


Gly Ala Ala Asp Val Glu Leu Tyr Gly Gly Gly Arg Ser Leu Glu Tyr
    50                55                60


Leu Leu Lys Arg Val Asp Thr Glu Ala Asp Leu Gly Gln Phe Thr Asp
65                70                75                80
```

121

```
Ile Ile Lys Ser Leu Ser Leu Lys Arg Leu Thr Val Arg Ala Ala Arg
              85              90                  95

Ile Pro Ser Arg Ile Leu Phe Gly Ala Leu Arg Val Leu Gly Ile Ser
            100             105                 110

Gly Leu Gln Glu Leu Thr Leu Glu Asn Leu Glu Val Thr Gly Thr Ala
            115             120                 125

Pro Pro Pro Leu Leu Glu Ala Thr Gly Pro Asp Leu Asn Ile Leu Asn
    130             135                 140

Leu Arg Asn Val Ser Trp Ala Thr Arg Asp Ala Trp Leu Ala Glu Leu
145             150                 155                 160

Gln Gln Trp Leu Lys Pro Gly Leu Lys Val Leu Ser Ile Ala Gln Ala
            165             170                 175

His Ser Leu Asn Phe Ser Cys Glu Gln Val Arg Val Phe Pro Ala Leu
            180             185                 190

Ser Thr Leu Asp Leu Ser Asp Asn Pro Glu Leu Gly Glu Arg Gly Leu
            195             200                 205

Ile Ser Ala Leu Cys Pro Leu Lys Phe Pro Thr Leu Gln Val Leu Ala
    210             215                 220

Leu Arg Asn Ala Gly Met Glu Thr Pro Ser Gly Val Cys Ser Ala Leu
225             230                 235                 240

Ala Ala Ala Arg Val Gln Leu Gln Gly Leu Asp Leu Ser His Asn Ser
            245             250                 255

Leu Arg Asp Ala Ala Gly Ala Pro Ser Cys Asp Trp Pro Ser Gln Leu
            260             265                 270

Asn Ser Leu Asn Leu Ser Phe Thr Gly Leu Lys Gln Val Pro Lys Gly
    275             280                 285

Leu Pro Ala Lys Leu Ser Val Leu Asp Leu Ser Tyr Asn Arg Leu Asp
    290             295                 300
```

122

```
Arg Asn Pro Ser Pro Asp Glu Leu Pro Gln Val Gly Asn Leu Ser Leu
305             310             315                 320


Lys Gly Asn Pro Phe Leu Asp Ser Glu Ser His Ser Glu Lys Phe Asn
            325             330                 335


Ser Gly Val Val Thr Ala Gly Ala Pro Ser Ser Gln Ala Val Ala Leu
            340             345                 350


Ser Gly Thr Leu Ala Leu Leu Leu Gly Asp Arg Leu Phe Val
        355             360                 365
```

<210> 73
<211> 365
<212> PRT
<213> Mus musculus

<400> 73

```
Met Asp Lys Phe Trp Trp His Thr Ala Trp Gly Leu Cys Leu Leu Gln
1               5               10                  15


Leu Ser Leu Ala His Pro His Gln Gln Ile Asp Leu Asn Val Thr Cys
            20              25                  30


Arg Tyr Ala Gly Val Phe His Val Glu Lys Asn Gly Arg Tyr Ser Ile
        35              40                  45


Ser Arg Thr Glu Ala Ala Asp Leu Cys Gln Ala Phe Asn Ser Thr Leu
    50              55                  60


Pro Thr Met Asp Gln Met Lys Leu Ala Leu Ser Lys Gly Phe Glu Thr
65              70              75                  80


Cys Arg Tyr Gly Phe Ile Glu Gly Asn Val Val Ile Pro Arg Ile His
            85              90                  95


Pro Asn Ala Ile Cys Ala Ala Asn His Thr Gly Val Tyr Ile Leu Val
            100             105                 110


Thr Ser Asn Thr Ser His Tyr Asp Thr Tyr Cys Phe Asn Ala Ser Ala
        115             120                 125
```

123

```
Pro Pro Glu Glu Asp Cys Thr Ser Val Thr Asp Leu Pro Asn Ser Phe
    130             135             140

Asp Gly Pro Val Thr Ile Thr Ile Val Asn Arg Asp Gly Thr Arg Tyr
145             150             155             160

Ser Lys Lys Gly Glu Tyr Arg Thr His Gln Glu Asp Ile Asp Ala Ser
            165             170             175

Asn Ile Ile Asp Asp Asp Val Ser Ser Gly Ser Thr Ile Glu Lys Ser
            180             185             190

Thr Pro Glu Ser Tyr Ile Leu His Thr Tyr Leu Pro Thr Glu Gln Pro
        195             200             205

Thr Gly Asp Gln Asp Asp Ser Phe Phe Ile Arg Ser Thr Leu Ala Thr
    210             215             220

Arg Asp Arg Asp Ser Ser Lys Asp Ser Arg Gly Ser Ser Arg Thr Val
225             230             235             240

Thr His Gly Ser Glu Leu Ala Gly His Ser Ser Ala Asn Gln Asp Ser
            245             250             255

Gly Val Thr Thr Thr Ser Gly Pro Met Arg Arg Pro Gln Ile Pro Glu
        260             265             270

Trp Leu Ile Ile Leu Ala Ser Leu Leu Ala Leu Ala Leu Ile Leu Ala
        275             280             285

Val Cys Ile Ala Val Asn Ser Arg Arg Arg Cys Gly Gln Lys Lys Lys
    290             295             300

Leu Val Ile Asn Gly Gly Asn Gly Thr Val Glu Asp Arg Lys Pro Ser
305             310             315             320

Glu Leu Asn Gly Glu Ala Ser Lys Ser Gln Glu Met Val His Leu Val
            325             330             335

Asn Lys Glu Pro Ser Glu Thr Pro Asp Gln Cys Met Thr Ala Asp Glu
            340             345             350
```

124

Thr Arg Asn Leu Gln Ser Val Asp Met Lys Ile Gly Val
     355   360   365

<210> 74
<211> 371
<212> PRT
<213> Mus musculus

<400> 74

Met Asn Val Lys Gly Lys Val Ile Leu Leu Met Leu Ile Val Ser Thr
1   5   10   15

Val Val Val Val Phe Trp Glu Tyr Val Asn Ser Pro Asp Gly Ser Phe
     20   25   30

Leu Trp Ile Tyr His Thr Lys Ile Pro Glu Val Gly Glu Asn Arg Trp
     35   40   45

Gln Lys Asp Trp Trp Phe Pro Ser Trp Phe Lys Asn Gly Thr His Ser
   50   55   60

Tyr Gln Glu Asp Asn Val Glu Gly Arg Arg Glu Lys Gly Arg Asn Gly
65   70   75   80

Asp Arg Ile Glu Glu Pro Gln Leu Trp Asp Trp Phe Asn Pro Lys Asn
     85   90   95

Arg Pro Asp Val Leu Thr Val Thr Pro Trp Lys Ala Pro Ile Val Trp
     100   105   110

Glu Gly Thr Tyr Asp Thr Ala Leu Leu Glu Lys Tyr Tyr Ala Thr Gln
     115   120   125

Lys Leu Thr Val Gly Leu Thr Val Phe Ala Val Gly Lys Tyr Ile Glu
    130   135   140

His Tyr Leu Glu Asp Phe Leu Glu Ser Ala Asp Met Tyr Phe Met Val
145   150   155   160

Gly His Arg Val Ile Phe Tyr Val Met Ile Asp Asp Thr Ser Arg Met
     165   170   175

125

Pro Val Val His Leu Asn Pro Leu His Ser Leu Gln Val Phe Glu Ile
        180   185   190

Arg Ser Glu Lys Arg Trp Gln Asp Ile Ser Met Met Arg Met Lys Thr
        195   200   205

Ile Gly Glu His Ile Leu Ala His Ile Gln His Glu Val Asp Phe Leu
    210   215   220

Phe Cys Met Asp Val Asp Gln Val Phe Gln Asp Asn Phe Gly Val Glu
225   230   235   240

Thr Leu Gly Gln Leu Val Ala Gln Leu Gln Ala Trp Trp Tyr Lys Ala
        245   250   255

Ser Pro Glu Lys Phe Thr Tyr Glu Arg Arg Glu Leu Ser Ala Ala Tyr
        260   265   270

Ile Pro Phe Gly Glu Gly Asp Phe Tyr Tyr His Ala Ala Ile Phe Gly
        275   280   285

Gly Thr Pro Thr His Ile Leu Asn Leu Thr Arg Glu Cys Phe Lys Gly
    290   295   300

Ile Leu Gln Asp Lys Lys His Asp Ile Glu Ala Gln Trp His Asp Glu
305   310   315   320

Ser His Leu Asn Lys Tyr Phe Leu Phe Asn Lys Pro Thr Lys Ile Leu
            325   330   335

Ser Pro Glu Tyr Cys Trp Asp Tyr Gln Ile Gly Leu Pro Ser Asp Ile
    .   340   345   350

Lys Ser Val Lys Val Ala Trp Gln Thr Lys Glu Tyr Asn Leu Val Arg
        355   360   365

Asn Asn Val
    370

126

<210> 75
<211> 79 <212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (3)..(77)
<223>

<400> 75

```
gc agt tta acg ggg gag ggg act cag ccc cag cat ttt ggt gat ggg          47
   Ser Leu Thr Gly Glu Gly Thr Gln Pro Gln His Phe Gly Asp Gly
   1               5                   10                  15

act cga ctc tcc atc cta gag gac ctg aac aa                              79
Thr Arg Leu Ser Ile Leu Glu Asp Leu Asn
                20                  25
```

<210> 76
<211> 25
<212> PRT
<213> Homo sapiens

<400> 76

```
Ser Leu Thr Gly Glu Gly Thr Gln Pro Gln His Phe Gly Asp Gly Thr
1               5                   10                  15

Arg Leu Ser Ile Leu Glu Asp Leu Asn
                20                  25
```

<210> 77
<211> 1197
<212> DNA
<213> Streptococcus pyogenes

<220>
<221> CDS
<222> (106)..(1119)
<223> '

<400> 77

```
attggctctg gagatggatt ataaagagat tgcagatgcc aaaggtgcaa ctatcacagg      60

ggcatggtca gacagtccac aaattatatt agacggaggt aaaaa atg agt gaa aat     117
                                                    Met Ser Glu Asn
                                                    1

ata ccg ctg cga gtc caa ttt aag cgc atg aaa gcc gcc gag tgg gct       165
Ile Pro Leu Arg Val Gln Phe Lys Arg Met Lys Ala Ala Glu Trp Ala
5                   10                  15                  20
```

127

```
cgt agt gat gtc atc tta ctg gag agc gag ata ggc ttt gag aca gac      213
Arg Ser Asp Val Ile Leu Leu Glu Ser Glu Ile Gly Phe Glu Thr Asp
                25                  30                  35

aca ggt ttt gcc aga gca ggt gat ggg cac aat cga ttt agt gac ctt      261
Thr Gly Phe Ala Arg Ala Gly Asp Gly His Asn Arg Phe Ser Asp Leu
                40                  45                  50

gga tac att agt cca ctc gat tac aat cta ctg act aac aag cca aat      309
Gly Tyr Ile Ser Pro Leu Asp Tyr Asn Leu Leu Thr Asn Lys Pro Asn
                55                  60                  65

att gat gga tta gcg aca aaa gtc gag acc gct cag aaa cta caa caa      357
Ile Asp Gly Leu Ala Thr Lys Val Glu Thr Ala Gln Lys Leu Gln Gln
        70                  75                  80

aaa gca gat aaa gag acc gtc tat aca aaa gct gaa tcg aag caa gag      405
Lys Ala Asp Lys Glu Thr Val Tyr Thr Lys Ala Glu Ser Lys Gln Glu
85                  90                  95                  100

ctt gac aag aaa tta aat ctc aaa ggt ggc gtt atg aca ggt caa cta      453
Leu Asp Lys Lys Leu Asn Leu Lys Gly Gly Val Met Thr Gly Gln Leu
                105                 110                 115

aaa ttt aag cca gcc gcc act gtt gct tat tcc tcg tca acg ggt gga      501
Lys Phe Lys Pro Ala Ala Thr Val Ala Tyr Ser Ser Ser Thr Gly Gly
                120                 125                 130

gcg gtc aat att gac ttg tcg tct acc aga ggt gct ggt gtt gtt gtc      549
Ala Val Asn Ile Asp Leu Ser Ser Thr Arg Gly Ala Gly Val Val Val
        135                 140                 145

tat tct gac aat gat acc agt gat ggg ccg tta atg agc ttg cgg acg      597
Tyr Ser Asp Asn Asp Thr Ser Asp Gly Pro Leu Met Ser Leu Arg Thr
    150                 155                 160

ggt aaa gag acc ttt aat caa tcg gcg ctt ttt gtc gac tat aag ggg      645
Gly Lys Glu Thr Phe Asn Gln Ser Ala Leu Phe Val Asp Tyr Lys Gly
165                 170                 175                 180

aca aca aat gcc gtt aat att gcg atg cgt cac gca acc acc ccc aat      693
Thr Thr Asn Ala Val Asn Ile Ala Met Arg His Ala Thr Thr Pro Asn
                185                 190                 195

ttt tca tcg gcg ctt aat att act agc ggc aat gaa aat ggt agt gca      741
Phe Ser Ser Ala Leu Asn Ile Thr Ser Gly Asn Glu Asn Gly Ser Ala
            200                 205                 210

atg cag cta cga ggg tca gaa aaa gcg cta gga acg cta aaa att act      789
Met Gln Leu Arg Gly Ser Glu Lys Ala Leu Gly Thr Leu Lys Ile Thr
            215                 220                 225

cat gag aac cca agt att gga gcg gat tat gat aaa aat gcg gca cgt      837
His Glu Asn Pro Ser Ile Gly Ala Asp Tyr Asp Lys Asn Ala Ala Arg
            230                 235                 240
```

128

```
tat cca ttg ata ttg tca aaa aga caa aac ggt gca gga aca gcc gct      885
Tyr Pro Leu Ile Leu Ser Lys Arg Gln Asn Gly Ala Gly Thr Ala Ala
245                 250             255             260

cag gga atc tac att aac tca acc tca ggc acg aca ggg aag ttg ctt      933
Gln Gly Ile Tyr Ile Asn Ser Thr Ser Gly Thr Thr Gly Lys Leu Leu
                265             270             275

agg att aga aac ctt agt gat gat aag ttc tac gtc aag tct gac ggt      981
Arg Ile Arg Asn Leu Ser Asp Asp Lys Phe Tyr Val Lys Ser Asp Gly
                280             285             290

ggt ttt tat gcc aag gaa act tcg cag att gat ggc aac ctg aaa ctc     1029
Gly Phe Tyr Ala Lys Glu Thr Ser Gln Ile Asp Gly Asn Leu Lys Leu
            295             300             305

aag gac ccc aca gcg aat gat cat gcg gca acc aaa gct tat gta gat     1077
Lys Asp Pro Thr Ala Asn Asp His Ala Ala Thr Lys Ala Tyr Val Asp
        310             315             320

aaa gca att tct gag tta aaa aaa ctc ata cta aaa aaa tag           1119
Lys Ala Ile Ser Glu Leu Lys Lys Leu Ile Leu Lys Lys
325             330             335

attaaggagg ataaatgagc agagacccaa cacttatttt agacgagtca aacctcgtta   1179

ttggtaagga tggacgtg                                                 1197
```

```
<210>  78
<211>  337
<212>  PRT
<213>  Streptococcus pyogenes

<400>  78

Met Ser Glu Asn Ile Pro Leu Arg Val Gln Phe Lys Arg Met Lys Ala
1               5                   10                  15


Ala Glu Trp Ala Arg Ser Asp Val Ile Leu Leu Glu Ser Glu Ile Gly
            20                  25                  30


Phe Glu Thr Asp Thr Gly Phe Ala Arg Ala Gly Asp Gly His Asn Arg
            35                  40                  45


Phe Ser Asp Leu Gly Tyr Ile Ser Pro Leu Asp Tyr Asn Leu Leu Thr
        50                  55                  60


Asn Lys Pro Asn Ile Asp Gly Leu Ala Thr Lys Val Glu Thr Ala Gln
65                  70                  75                  80
```

129

Lys Leu Gln Gln Lys Ala Asp Lys Glu Thr Val Tyr Thr Lys Ala Glu
                85   90   95

Ser Lys Gln Glu Leu Asp Lys Lys Leu Asn Leu Lys Gly Gly Val Met
            100   105   110

Thr Gly Gln Leu Lys Phe Lys Pro Ala Ala Thr Val Ala Tyr Ser Ser
            115   120   125

Ser Thr Gly Gly Ala Val Asn Ile Asp Leu Ser Ser Thr Arg Gly Ala
        130   135   140

Gly Val Val Val Tyr Ser Asp Asn Asp Thr Ser Asp Gly Pro Leu Met
145   150   155   160

Ser Leu Arg Thr Gly Lys Glu Thr Phe Asn Gln Ser Ala Leu Phe Val
            165   170   175

Asp Tyr Lys Gly Thr Thr Asn Ala Val Asn Ile Ala Met Arg His Ala
            180   185   190

Thr Thr Pro Asn Phe Ser Ser Ala Leu Asn Ile Thr Ser Gly Asn Glu
            195   200   205

Asn Gly Ser Ala Met Gln Leu Arg Gly Ser Glu Lys Ala Leu Gly Thr
    210   215   220

Leu Lys Ile Thr His Glu Asn Pro Ser Ile Gly Ala Asp Tyr Asp Lys
225   230   235   240

Asn Ala Ala Arg Tyr Pro Leu Ile Leu Ser Lys Arg Gln Asn Gly Ala
            245   250   255

Gly Thr Ala Ala Gln Gly Ile Tyr Ile Asn Ser Thr Ser Gly Thr Thr
        260   265   270

Gly Lys Leu Leu Arg Ile Arg Asn Leu Ser Asp Asp Lys Phe Tyr Val
        275   280   285

Lys Ser Asp Gly Gly Phe Tyr Ala Lys Glu Thr Ser Gln Ile Asp Gly
    290   295   300

130

```
Asn Leu Lys Leu Lys Asp Pro Thr Ala Asn Asp His Ala Ala Thr Lys
305             310             315             320


Ala Tyr Val Asp Lys Ala Ile Ser Glu Leu Lys Lys Leu Ile Leu Lys
            325             330             335


Lys
```

```
<210>  79
<211>  1497
<212>  DNA
<213>  Bacteriophage T270

<220>
<221>  CDS
<222>  (286)..(1374)
<223>

<400>  79
gaagacattg taaaatacaa tacaattatg agagatcaat ataaaaaagg tagcaatgaa    60

tataatgcgt ttcaacaaga tattgagcaa gataaaaacc agatagcact attgttcaac   120

gaacatcaat tgcttgaaaa tatcgataat tagttaatct aaaacaaaaa gccccacgct   180

ctcaaagttt ggcgactctg agcgtgaggc aagacagtat aagaaacaac cattaaaaag   240

gtcattttct tgtacctatt ttatcaaatt gaaagatggt atgca atg aaa att aaa   297
                                                 Met Lys Ile Lys
                                                 1

tca tat aaa aag gaa aat ggt gaa act gct tat aaa ttt ctt ttg tat    345
Ser Tyr Lys Lys Glu Asn Gly Glu Thr Ala Tyr Lys Phe Leu Leu Tyr
5               10              15              20

gcc ggt tat gtt aat gga aag aga aaa tat att agg cga gaa ggt ttc    393
Ala Gly Tyr Val Asn Gly Lys Arg Lys Tyr Ile Arg Arg Glu Gly Phe
                25              30              35

aaa act aag cag gct gca agg gaa acc tta att agt tta caa gct gaa    441
Lys Thr Lys Gln Ala Ala Arg Glu Thr Leu Ile Ser Leu Gln Ala Glu
                40              45              50

ctt gat aaa cct aaa tca agt atg aca ttt gga gca ttg aca gat caa    489
Leu Asp Lys Pro Lys Ser Ser Met Thr Phe Gly Ala Leu Thr Asp Gln
            55              60              65

tgg cta aag gaa tat gaa aaa acc gtt cag ggc agt acc tac tta aaa    537
Trp Leu Lys Glu Tyr Glu Lys Thr Val Gln Gly Ser Thr Tyr Leu Lys
        70              75              80
```

131

```
aca gaa aga aat att aat aaa cat att ttg cca aaa ctt gat aaa gtg    585
Thr Glu Arg Asn Ile Asn Lys His Ile Leu Pro Lys Leu Asp Lys Val
85                  90                  95                  100

aag att gga gac atc aat cca cta ctt atc cag cgg ctt act gaa gaa    633
Lys Ile Gly Asp Ile Asn Pro Leu Leu Ile Gln Arg Leu Thr Glu Glu
                    105                 110                 115

tgg tgc aac gat tta aaa tat gga gga aaa att ctt ggg ctt gtt agg    681
Trp Cys Asn Asp Leu Lys Tyr Gly Gly Lys Ile Leu Gly Leu Val Arg
                120                 125                 130

aat atc tta aat cta gct gtt aga tac gga tat atc aat aac aat cca    729
Asn Ile Leu Asn Leu Ala Val Arg Tyr Gly Tyr Ile Asn Asn Asn Pro
                135                 140                 145

gct ttg cca att aca cct cca aaa ata aaa agg aaa aga aaa atg aat    777
Ala Leu Pro Ile Thr Pro Pro Lys Ile Lys Arg Lys Arg Lys Met Asn
        150                 155                 160

aat aat ttt tat aca ctt gat caa ctt aaa caa ttc ctt gaa cta gtt    825
Asn Asn Phe Tyr Thr Leu Asp Gln Leu Lys Gln Phe Leu Glu Leu Val
165                 170                 175                 180

gaa aaa act gac aac att gaa aaa ata gcc ttg ttt aga tta tta gca    873
Glu Lys Thr Asp Asn Ile Glu Lys Ile Ala Leu Phe Arg Leu Leu Ala
                185                 190                 195

ttt act gga ata cga aaa ggg gag ctt ctg gca cta act tgg gat gat    921
Phe Thr Gly Ile Arg Lys Gly Glu Leu Leu Ala Leu Thr Trp Asp Asp
                200                 205                 210

ttg aat ggt aat act cta tca att aat aaa gct gtc aca cgt act caa    969
Leu Asn Gly Asn Thr Leu Ser Ile Asn Lys Ala Val Thr Arg Thr Gln
                215                 220                 225

gtt gga cta gaa ata gat gtt acg aag aca aaa tca agc gat aga tta    1017
Val Gly Leu Glu Ile Asp Val Thr Lys Thr Lys Ser Ser Asp Arg Leu
        230                 235                 240

atc agc tta gat gat gaa act ttg gaa att tta caa gaa ctt cat gaa    1065
Ile Ser Leu Asp Asp Glu Thr Leu Glu Ile Leu Gln Glu Leu His Glu
245                 250                 255                 260

act ttt cct act tct act ctt atg ttc caa tct aaa tca ggt gga att    1113
Thr Phe Pro Thr Ser Thr Leu Met Phe Gln Ser Lys Ser Gly Gly Ile
                265                 270                 275

atg acg cca agt tta cca cga aaa tgg cta ttg caa att atc aaa ggg    1161
Met Thr Pro Ser Leu Pro Arg Lys Trp Leu Leu Gln Ile Ile Lys Gly
                280                 285                 290

ata gac tta cca caa atc aca att cat ggt ttc agg cac act cat gca    1209
Ile Asp Leu Pro Gln Ile Thr Ile His Gly Phe Arg His Thr His Ala
                295                 300                 305
```

132

```
agc tta ctt ttc gaa tca ggt cta tcc ttg aaa cag gtg caa cat aga    1257
Ser Leu Leu Phe Glu Ser Gly Leu Ser Leu Lys Gln Val Gln His Arg
    310             315             320

tta ggg cat gga gat tta cag aca act atg aac gta tat act cac atc    1305
Leu Gly His Gly Asp Leu Gln Thr Thr Met Asn Val Tyr Thr His Ile
325             330             335             340

acg caa tcg gca att gat gac att gga act aaa ttc aat caa ttt gtt    1353
Thr Gln Ser Ala Ile Asp Asp Ile Gly Thr Lys Phe Asn Gln Phe Val
                345             350             355

act aac aag caa cta gat tga caactaattc tcaacaaacg ttaatttaac      1404
Thr Asn Lys Gln Leu Asp
                360

aacattcaag taactcccac cagctccatc aatgcttacc gtaagtaatc ataacttact  1464

aaaaccttgt tacatcaagg tttttctttt ttg                              1497
```

<210> 80
<211> 362
<212> PRT
<213> Bacteriophage T270

<400> 80

```
Met Lys Ile Lys Ser Tyr Lys Lys Glu Asn Gly Glu Thr Ala Tyr Lys
1               5               10              15


Phe Leu Leu Tyr Ala Gly Tyr Val Asn Gly Lys Arg Lys Tyr Ile Arg
            20              25              30


Arg Glu Gly Phe Lys Thr Lys Gln Ala Ala Arg Glu Thr Leu Ile Ser
        35              40              45


Leu Gln Ala Glu Leu Asp Lys Pro Lys Ser Ser Met Thr Phe Gly Ala
    50              55              60


Leu Thr Asp Gln Trp Leu Lys Glu Tyr Glu Lys Thr Val Gln Gly Ser
65              70              75              80


Thr Tyr Leu Lys Thr Glu Arg Asn Ile Asn Lys His Ile Leu Pro Lys
                85              90              95


Leu Asp Lys Val Lys Ile Gly Asp Ile Asn Pro Leu Leu Ile Gln Arg
                100             105             110
```

133

```
Leu Thr Glu Glu Trp Cys Asn Asp Leu Lys Tyr Gly Gly Lys Ile Leu
        115             120         .       125

Gly Leu Val Arg Asn Ile Leu Asn Leu Ala Val Arg Tyr Gly Tyr Ile
    130             135     .           140

Asn Asn Asn Pro Ala Leu Pro Ile Thr Pro Pro Lys Ile Lys Arg Lys
145             150             .       155                 160

Arg Lys Met Asn Asn Asn Phe Tyr Thr Leu Asp Gln Leu Lys Gln Phe
            165                 170             .       175

Leu Glu Leu Val Glu Lys Thr Asp Asn Ile Glu Lys Ile Ala Leu Phe
        180             185                 190

Arg Leu Leu Ala Phe Thr Gly Ile Arg Lys Gly Glu Leu Leu Ala Leu
    195             200                 205

Thr Trp Asp Asp Leu Asn Gly Asn Thr Leu Ser Ile Asn Lys Ala Val
    210             215         .       220

Thr Arg Thr Gln Val Gly Leu Glu Ile Asp Val Thr Lys Thr Lys Ser
225             230                 235         .       240

Ser Asp Arg Leu Ile Ser Leu Asp Asp Glu Thr Leu Glu Ile Leu Gln
            245             .       250                 255

Glu Leu His Glu Thr Phe Pro Thr Ser Thr Leu Met Phe Gln Ser Lys
            260         .       265             270

Ser Gly Gly Ile Met Thr Pro Ser Leu Pro Arg Lys Trp Leu Leu Gln
    275                 280                 285

Ile Ile Lys Gly Ile Asp Leu Pro Gln Ile Thr Ile His Gly Phe Arg
    290             295                 300

His Thr His Ala Ser Leu Leu Phe Glu Ser Gly Leu Ser Leu Lys Gln
305     .           310             315                 320

Val Gln His Arg Leu Gly His Gly Asp Leu Gln Thr Thr Met Asn Val
            325             330             335
```

134

```
    Tyr Thr His Ile Thr Gln Ser Ala Ile Asp Asp Ile Gly Thr Lys Phe
            340                 345                 350


    Asn Gln Phe Val Thr Asn Lys Gln Leu Asp
            355                 360
```

<210> 81
<211> 2187
<212> DNA
<213> Staphylococcus aureus

<220>
<221> CDS
<222> (752)..(1744)
<223>

<400> 81
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atcgataact ttctttgttc cattttttaaa gtaaacagta tatttcgctt gcttcgatag      60

tcttaaatct atatcactaa tacctctgtc tgattttaaa actgatttaa ctctatcctc     120

taaatctttta taactaatat tttgattctt attaaatgtt aagcttgata aaatattttg     180

gcttgtaccg ttcacagtga ttgcatatgg aacatggact ttagaatatc catggtgtaa     240

cgaacttgat gatttatcta atggcttagc tgcggcagac gcttcattat tattaaagtt     300

tgcacctgtt gatgctaaaa cacctaatgc taaagttgtt gtaatcaatg acttaaattt     360

cataaattat ctctcctttt ttgtgtaatt cgtatttgca acttaattat agccagactt     420

tctctatttt ttgaattaac tgaatattaa taataaatta tctttaacaa taattttta      480

acactgttaa aagttctttt aattttgatt aactaattaa tttacaatac ctaaaatgtt     540

gtttggtttt gtttatacca agcttcaaac ttaaatgtca taacaacatt catttcttaa     600

ttccgattag atttgtcgat tatatttaca gcatctttat actcaaaaaa catttactta     660

aaaatataaa ttctatttaa taattaattt aaatttagtt aatcaatttt gcatctattt     720

tgttgtaagc tatataaaag gagtgataat g atg gtg aaa aaa aca aaa tcc      772
                                    Met Val Lys Lys Thr Lys Ser
                                    1               5

aat tca cta aaa aaa gtt gca aca ctt gca tta gca aat tta tta tta     820
Asn Ser Leu Lys Lys Val Ala Thr Leu Ala Leu Ala Asn Leu Leu Leu
        10              15                  20

gtt ggt gca ctt act gac aat agt gcc aaa gcc gaa tct aag aaa gat     868
Val Gly Ala Leu Thr Asp Asn Ser Ala Lys Ala Glu Ser Lys Lys Asp
        25              30                  35
```

135

```
gat act gat ttg aag tta gtt agt cat aac gtt tat atg tta tcg acc       916
Asp Thr Asp Leu Lys Leu Val Ser His Asn Val Tyr Met Leu Ser Thr
40               45                  50                  55

gtt ttg tat cca aac tgg ggg caa tat aaa cgc gct gat tta atc gga       964
Val Leu Tyr Pro Asn Trp Gly Gln Tyr Lys Arg Ala Asp Leu Ile Gly
                    60                  65                  70

caa tct tct tat att aaa aat aat gat gtc gta ata ttc aat gaa gca      1012
Gln Ser Ser Tyr Ile Lys Asn Asn Asp Val Val Ile Phe Asn Glu Ala
                75                  80                  85

ttt gat aat ggt gca tca gac aaa tta tta agt aat gtg aaa aaa gaa      1060
Phe Asp Asn Gly Ala Ser Asp Lys Leu Leu Ser Asn Val Lys Lys Glu
            90                  95                  100

tat cct tat caa aca cct gta ctc ggc cgt tct caa tca ggg tgg gac      1108
Tyr Pro Tyr Gln Thr Pro Val Leu Gly Arg Ser Gln Ser Gly Trp Asp
        105                 110                 115

aaa act gaa ggt agc tac tca tca act gtt gca gaa gat ggt ggc gta      1156
Lys Thr Glu Gly Ser Tyr Ser Ser Thr Val Ala Glu Asp Gly Gly Val
120                 125                 130                 135

gcg att gta agt aaa tat cct att aaa gaa aaa atc cag cat gtt ttc      1204
Ala Ile Val Ser Lys Tyr Pro Ile Lys Glu Lys Ile Gln His Val Phe
                140                 145                 150

aaa agc ggt tgt gga ttc gat aat gat agc aac aaa ggc ttt gtt tat      1252
Lys Ser Gly Cys Gly Phe Asp Asn Asp Ser Asn Lys Gly Phe Val Tyr
                155                 160                 165

aca aaa ata gag aaa aat ggt aag aac gtt cac gtt atc ggt aca cat      1300
Thr Lys Ile Glu Lys Asn Gly Lys Asn Val His Val Ile Gly Thr His
        170                 175                 180

aca caa tct gaa gat tca cgt tgt ggt gct gga cat gat cga aaa att      1348
Thr Gln Ser Glu Asp Ser Arg Cys Gly Ala Gly His Asp Arg Lys Ile
        185                 190                 195

aga gct gaa caa atg aaa gaa atc agt gac ttt gtt aaa aag aaa aat      1396
Arg Ala Glu Gln Met Lys Glu Ile Ser Asp Phe Val Lys Lys Lys Asn
200                 205                 210                 215

atc cct aaa gat gaa acg gta tat ata ggt ggc gac ctt aat gtc aat      1444
Ile Pro Lys Asp Glu Thr Val Tyr Ile Gly Gly Asp Leu Asn Val Asn
                220                 225                 230

aaa ggc act cca gag ttc aaa gat atg ctt aaa aac ttg aat gta aat      1492
Lys Gly Thr Pro Glu Phe Lys Asp Met Leu Lys Asn Leu Asn Val Asn
                235                 240                 245

gat gtt cta tat gca ggt cat aat agc aca tgg gac cct caa tca aat      1540
Asp Val Leu Tyr Ala Gly His Asn Ser Thr Trp Asp Pro Gln Ser Asn
        250                 255                 260
```

136

```
tca att gcg aaa tat aat tac cct aat ggt aaa cca gaa cat tta gac      1588
Ser Ile Ala Lys Tyr Asn Tyr Pro Asn Gly Lys Pro Glu His Leu Asp
    265             270             275

tat ata ttt aca gat aaa gat cat aaa caa cca aaa caa tta gtc aat      1636
Tyr Ile Phe Thr Asp Lys Asp His Lys Gln Pro Lys Gln Leu Val Asn
280             285             290             295

gaa gtt gtg act gaa aaa cct aag cca tgg gat gta tat gcg ttc cca      1684
Glu Val Val Thr Glu Lys Pro Lys Pro Trp Asp Val Tyr Ala Phe Pro
            300             305             310

tat tac tac gtt tac aat gat ttt tca gat cat tac cca atc aaa gcc      1732
Tyr Tyr Tyr Val Tyr Asn Asp Phe Ser Asp His Tyr Pro Ile Lys Ala
        315             320             325

tat agt aaa tag tgctcaacta actaataact ttgcttcgtt ctaaaaggac         1784
Tyr Ser Lys
        330

gaagcgagtt atattgttaa aatttgaatt gacttacatt ttaataaaat catcttaaca   1844

actttaattt ttcattaata caagtcttta ctctacactc aaacaagatt catacactgc   1904

acgtcataat aaatctatct attcaaatat aaataaaagt tacctactac attctatgta   1964

gcaggcaact tttattactt atttcttttc attatcatta agtactttta caaacttcac   2024

attatgtgtc ttccaatcaa cttcatataa tgctgataat ttttcttctt ttttatctac   2084

atggttttca ccagaccaat agccccagaa accatggcga ttccaatcta ttttaaactc   2144

atccattgat cgtttaactc taacgtgtcg catggaaatc gat                     2187
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<210> 82
<211> 330
<212> PRT
<213> Staphylococcus aureus

<400> 82

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Met Val Lys Lys Thr Lys Ser Asn Ser Leu Lys Lys Val Ala Thr Leu
1               5                   10                  15


Ala Leu Ala Asn Leu Leu Leu Val Gly Ala Leu Thr Asp Asn Ser Ala
            20                  25                  30


Lys Ala Glu Ser Lys Lys Asp Asp Thr Asp Leu Lys Leu Val Ser His
        35                  40                  45
```

137

Asn Val Tyr Met Leu Ser Thr Val Leu Tyr Pro Asn Trp Gly Gln Tyr
    50   55   60

Lys Arg Ala Asp Leu Ile Gly Gln Ser Ser Tyr Ile Lys Asn Asn Asp
65   70   75   80

Val Val Ile Phe Asn Glu Ala Phe Asp Asn Gly Ala Ser Asp Lys Leu
            85   90   95

Leu Ser Asn Val Lys Lys Glu Tyr Pro Tyr Gln Thr Pro Val Leu Gly
            100   105   110

Arg Ser Gln Ser Gly Trp Asp Lys Thr Glu Gly Ser Tyr Ser Ser Thr
        115   120   125

Val Ala Glu Asp Gly Gly Val Ala Ile Val Ser Lys Tyr Pro Ile Lys
    130   135   140

Glu Lys Ile Gln His Val Phe Lys Ser Gly Cys Gly Phe Asp Asn Asp
145   150   155   160

Ser Asn Lys Gly Phe Val Tyr Thr Lys Ile Glu Lys Asn Gly Lys Asn
            165   170   175

Val His Val Ile Gly Thr His Thr Gln Ser Glu Asp Ser Arg Cys Gly
            180   185   190

Ala Gly His Asp Arg Lys Ile Arg Ala Glu Gln Met Lys Glu Ile Ser
        195   200   205

Asp Phe Val Lys Lys Lys Asn Ile Pro Lys Asp Glu Thr Val Tyr Ile
    210   215   220

Gly Gly Asp Leu Asn Val Asn Lys Gly Thr Pro Glu Phe Lys Asp Met
225   230   235   240

Leu Lys Asn Leu Asn Val Asn Asp Val Leu Tyr Ala Gly His Asn Ser
            245   250   255

Thr Trp Asp Pro Gln Ser Asn Ser Ile Ala Lys Tyr Asn Tyr Pro Asn
            260   265   270

```
Gly Lys Pro Glu His Leu Asp Tyr Ile Phe Thr Asp Lys Asp His Lys
        275                 280                 285


Gln Pro Lys Gln Leu Val Asn Glu Val Val Thr Glu Lys Pro Lys Pro
        290                 295                 300


Trp Asp Val Tyr Ala Phe Pro Tyr Tyr Tyr Val Tyr Asn Asp Phe Ser
305                 310                 315                 320


Asp His Tyr Pro Ile Lys Ala Tyr Ser Lys
                325                 330
```

<210> 83
<211> 17276
<212> DNA
<213> Streptococcus agalactiae

<220>
<221> CDS
<222> (7062)..(8207)

<223>

<400> 83

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acaatctcag gactgtttat ttttatgatt aaacgaaact tcctctaata aatagtcaat     60

aaattttttgt cccattttttg aaaggtttgc tttgtcgtgt cggatataga caatatcaat    120

aacatcatcc acgtcaagag ggattgcgac aatttcgtca ccgttcaatt ttgagttgag    180

gataccagtt gccactgtat aaccatctaa tccaatcatt aaattaaaca gagttgctct    240

atcactgaca acaatggatt ttgggtgagg aatttgagac atcatttcct cagaaaagta    300

gaaagaatta tgcaggcctt gatcataact cagataagga taatcttcta aatctttcat    360

acttaatttt tttctattag ctaagggatt ggatttgctc acgaaaatat gaggtgtagt    420

agtaaaaaga gttgtggcaa ttaaggaatt atcgtcgaat aatttggtta atacatctct    480

attatagcta ttaagaaaca gaacaccaat ctctgaacgg aaattttttaa catcatcaat    540

aatttcccaa gtcctagttt cacgtaaaaa aagttcgtat tgggtcatgt ctgtgccatt    600

aaagagagct acaaaagcgt taaccacaaa tgcatagtgt tgtgaagaaa cgctgaacag    660

ctcacgactt gtattatcac ccttataacg ctcttcaaga agtgctgttt gttctagaat    720

ttgtcgcgca tatgacagaa attccatacc atcttttgtt aacgttattc cttttggatt    780

tcgaataaaa atttggatac ccatctcagt ctcaaggttc ctaacagcgt ttgaaagtga    840
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139

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aggttgggta atgtagagtt gtttagcggc ttcattcatg ctaccagttt ctacaatctt    900

aataacatat tgtaattgtt gaattctcat aattctagtt taaactagaa tgtaaataaa    960

ttcaattaga tcagctaaat tatcaatata gatcaattga aaatgttatt tagctaatat   1020

aatcagatta ttccaatatt attttcgttg aatattgtat tgaaaaatga tataatatcc   1080

aagtaaaatt aaggtttttt taagtattgg agaattacaa tgtctaatca ttcgcgccgt   1140

caccaaaaga aacactcaca tacacctcta cgggtgatta atttatttct tttggtgatt   1200

tttattttgt taagtgtagt ctcattattt cttatgtatc gtcaccattt tttggcattt   1260

agacacttga acgtcattta tggagttgta attattttaa tcattttagc aagtttattt   1320

ctttgtatta agaataaagc tagaattttt acaactataa ttttagtact atcctctatt   1380

ttcgttgcta ctactttata tggatttaag tcaaccattg atttgacaaa taatctaaat   1440

aaaactgctt catactctga aattgagatg agtgtagttg taccaaaaga ttctaaaata   1500

accaatatag aagctgtcag caaattagcc gcaccagtta aaaacgatac ttcaaatatt   1560

actgatttga tagaacatat aaaatcagaa aaaggaatct ctattacacc acaaaaaaca   1620

gattcttacc aggatgcata caatagaatt aaaaatggtg atagtcaagc tatggtttta   1680

aataatgctt atgttagctt aattgaactt agtacccctg attttaaatc gcagataaaa   1740

acgatttata cttacaaaat taagaaaaaa attaatcgta aaaatactaa tcataaagaa   1800

ggggtattta atatctatat tagcggtatt gatacttttg gctctatatc aacagtatca   1860

agatctgatg taaatattat tatgacggtt aataccaata cccacaaagt attgttaacg   1920

acaacaccac gagatgccta tgtaaaaatt ccagatggtg ggggcaatca atatgataaa   1980

ttaacccatg caggtttgta tggtgttgag acatcaatga aaacacttga aaacctttac   2040

gacatcaacc ttgattatta tgctagaatt aatttttcat catttttttaa aattaataga   2100

cctcttggga ggagtgacag tttatatacg atcaagcttt tacaagtaaa catggtaatt   2160

ttggactttc ctgttggtca agtaacattg aattctgagc aggctttggg ctttgttaga   2220

gaacgttatt ctctacaagg aggcgataac gatagaggta gaaatcaaga aaaagtgatt   2280

gcagctatta taaataagtt agcttctagt cagtcagtaa caaaattaaa tagcattacc   2340

tcacagctcc aaacgtccgt tcaaactaat atgactattg ataatattaa tgatttgatt   2400

aacaatcaat tgtcaactgg acaacgcttc actgtcgagt cacaagcatt aactggtcat   2460

ggttcaacgg gtgaactccc ttcatatgca atgccaggag ctcaacttta tatgatgtca   2520
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140

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attgatcaat ctagcttatc taatgcaaaa tcaaaaatta agaacacaat ggaggaataa    2580

caagaatgat tgatattcat tctcatatcg tttttgatgt agatgatggg cccaaaacgc    2640

ttgaagagag tttatcttta atagaagaaa gttatcgaca aggtgttaga ataattgttt    2700

cgacatcaca tagaagaaaa ggtatgtttg aaacacctga agatattatc ttcaaaaact    2760

tttctatagt taaacacgaa acggaaaaaa gatttgaaca tcttcaaatc ttatatggtg    2820

gagaattata ctatacaagt gatatgttag aaaaactgaa gttaaagcaa attccaactt    2880

taaacaatac gaaatttgct ttaattgaat tttctatgca aacttcttgg aaagatattc    2940

atacagcttt gtcaaatgtt ttaatgcttg gtattacacc agtcgttgcg catatagaga    3000

ggtataacgc tttagagaat caaaaagaac gggtgaagga aattattaat atggggtgtt    3060

acacacaaat aaatagtttc catattttga aacaaaaact ttttaatgat aagcataaac    3120

gctttaagaa aagagcccgt tattttttag aggaaaattt agtgcatttt gtagcgagtg    3180

atatgcataa ccttgatgtt agaccgccat ttttagcaga agcttataag attatctgta    3240

gagatttcgg taaagaacgt gctaaccaac tttttattga aaatgctcaa tctatattaa    3300

aaaaccatta catttaggag atttcatgaa taaaatagct aatacagaag ttgaaataaa    3360

tatattcaac cttttaaaaa aattgtggaa aaagaaattt ttaatcacat ttgttgccat    3420

tgcgtttgca acagctggac ttttctatag tctttttatt gttacgccac aatatacttc    3480

ttcaacaagg atatatgtca ttaaccctaa tacccctaat aatagtatta ctgcacaaga    3540

tctacaagcg gggagttttc ttgcaaatga ctataaggag attattacgt ctactgacgt    3600

tctagaaaaa gttatttctt ctgaaaaatt gaattatcct tcgtctcagt tgctacaaaa    3660

aataacagtt tctattttaa aagatacacg tgttatttca atatcggtcg aagatgctaa    3720

tccaaaaatg tctcaaaaat tagcaaattc agttagagaa gcagcagttt caaaaatcaa    3780

ggcagttact caagtagagg atatcactac tcttgagaag ggaaatttac ctaaagcacc    3840

atcttctcct aatattaaaa agaatgtact aatcgggttt attgttggtg caggattatc    3900

aactattgtt ttagttatta tggggatttt ggatgatcgt gttaatactg aagaagatat    3960

tgaaaaggtc ttaggactta cttctttagg tatagtacca gatttgaata aacttttaagg   4020

agaatataat gactcgttta gaaatagttg atagcaagtt aagacaagca aaaaaaacag    4080

aagaatactt caatgcgatc cgtacaaaca tacagtttag tggaaaggaa aataaaattc    4140

ttgcaattgc ctctgttagg gaaggggaag gaaaatccac tacttcaaca agtttagctt    4200
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141

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tatctttagc tcaagcagga tttaaaacat tattaattga tgcggatact aggaactctg    4260

ttatgtctgg aacctttaaa gcaactggaa ctattaaagg cttgacgaat tatttatcag    4320

gtaatgcaga tcttggagat attatctgtg aaaccaatgt tcctagactg atggtcgttc    4380

cttcaggaaa agtaccacca aatccaacag cattacttca gaacgcttat tttaataaga    4440

tgattgaagc tattaaaaat atatttgatt atattatcat cgatactcca cctattggtt    4500

tagttgttga tgccgcaata atcgctaatg cttgcgatgg ttttatttta gtaacccaag    4560

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caaagttctt aggtattatt cttaataaag ttaatgaatc tgttgctact tacggcgatt    4680

atggaaatta cggaaaaagg gatagaaaaa ggaagtaagg gactctggta ttgaaagaaa    4740

aagaaaatat acaaaagatt attatagcga tgattcaaac agttgtagtt tatttttctg    4800

caagtttgac attaacatta attactccca attttaaaag caataaagat ttattgtttg    4860

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gtggctatct tgaagagttt aaaatggtat tgaaatacag cttttactat attttcatat    4980

caagttcatt attttttatt tttaaaaact cttttacaac gacacgactt tccttttta     5040

cttttattgc tatgaattcg attttattat atctattgaa ttcattttta aaatattatc    5100

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tcttggactc ctctgaaaag gattgttatg atttgaaaca taactcgtta aggataataa    5280

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taatgtttaa gttagaagat gatcctagaa ttactaaaat aggaaaattt attcgaaaaa    5820

caagcataga tgagttgcct caattctata atgtttaaa aggcgatatg agtttagcag    5880
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142

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gaacacgccc tcccacagtt gatgaatatg aaaagtataa ttcaacgcag aagcgacgcc    5940

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atattaagat tattctccta acactaaagg tagttttact cgggacagga gctaagtaaa    6120

ggtaaggttt gaaaggaata taatgaaaat ttgtctggtt ggttcaagtg gtggtcatct    6180

agcacacttg aaccttttga aacccatttg ggaaaaagaa gataggtttt gggtaacctt    6240

tgataaagaa gatgctagga gtattctaag agaagagatt gtatatcatt gcttctttcc    6300

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aaaagaaaga ccagatgtta tcatatcatc tggtgccgct gtagcagtac cattctttta    6420

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gatatgtttt gtcataaatt agaaaaaatt ataggtgaaa t atg agg aaa tat cta    7076
                                             Met Arg Lys Tyr Leu
                                             1                 5

gat tta gat tat tct tta ttt tat gct ctt tgg gta ctt att tta gta    7124
Asp Leu Asp Tyr Ser Leu Phe Tyr Ala Leu Trp Val Leu Ile Leu Val
            10                  15                  20

cca aac caa tgg tat cag ttt tta att att acc att ata gtt cta tta    7172
Pro Asn Gln Trp Tyr Gln Phe Leu Ile Ile Thr Ile Ile Val Leu Leu
        25                  30                  35

tta ctt tgg aag agt gag ttt aga ata tct ata agc aat tct tca ata    7220
Leu Leu Trp Lys Ser Glu Phe Arg Ile Ser Ile Ser Asn Ser Ser Ile
    40                  45                  50
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143

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cta ttt ctg ctt tgg tta ttt att tat tta ttt gca ata ctc att aga       7268
Leu Phe Leu Leu Trp Leu Phe Ile Tyr Leu Phe Ala Ile Leu Ile Arg
    55                  60                  65

ggt act caa gag gat ata acg ttt cag cga ttt att gct gag cta tta       7316
Gly Thr Gln Glu Asp Ile Thr Phe Gln Arg Phe Ile Ala Glu Leu Leu
70                  75                  80                  85

aaa cta att agt aca gga tat gct tta ttt ttt tat aat tat tat aga       7364
Lys Leu Ile Ser Thr Gly Tyr Ala Leu Phe Phe Tyr Asn Tyr Tyr Arg
                90                  95                 100

aaa gct gat ttt aat agt tca gtt gta agg aat gtg gta aag gtt aac       7412
Lys Ala Asp Phe Asn Ser Ser Val Val Arg Asn Val Val Lys Val Asn
                105                 110                 115

tat ttt gtg ttg ttt ctt ata aca gtt tta tat tta ttt ttt cct atg      7460
Tyr Phe Val Leu Phe Leu Ile Thr Val Leu Tyr Leu Phe Phe Pro Met
                120                 125                 130

ctg aag cca act tta ttt gga aga gaa ttg ttt tca ata gag tgg ttt      7508
Leu Lys Pro Thr Leu Phe Gly Arg Glu Leu Phe Ser Ile Glu Trp Phe
    135                 140                 145

cca cat atg aga ata aga ctt gcg gca tat ttt gaa tat gct aca cta      7556
Pro His Met Arg Ile Arg Leu Ala Ala Tyr Phe Glu Tyr Ala Thr Leu
150                 155                 160                 165

att ggt cag ttt att tta ttt tct tat ccc ata ctt ttt ttg aaa ccc      7604
Ile Gly Gln Phe Ile Leu Phe Ser Tyr Pro Ile Leu Phe Leu Lys Pro
                170                 175                 180

caa aaa cat atg gaa aat att tta ata tcc tta ctg ttg act ata tgt      7652
Gln Lys His Met Glu Asn Ile Leu Ile Ser Leu Leu Leu Thr Ile Cys
                185                 190                 195

tca tac ttt tct ggc gct aga ata cta ttg gtc tgt atg ttg gtt tta      7700
Ser Tyr Phe Ser Gly Ala Arg Ile Leu Leu Val Cys Met Leu Val Leu
                200                 205                 210

tta gca tcg ctt ctt tta gat tat atc ctt ttt aaa act aat ttg aaa      7748
Leu Ala Ser Leu Leu Leu Asp Tyr Ile Leu Phe Lys Thr Asn Leu Lys
    215                 220                 225

ttg acc aag aaa aac act ttt ata ctt ggt atg act ttc tta ttt atc      7796
Leu Thr Lys Lys Asn Thr Phe Ile Leu Gly Met Thr Phe Leu Phe Ile
230                 235                 240                 245

acc gct tgt ttt tct tat aac ata tgg tca ata att gaa aaa ata att      7844
Thr Ala Cys Phe Ser Tyr Asn Ile Trp Ser Ile Ile Glu Lys Ile Ile
                250                 255                 260

atg tac aga aac caa agt act atc act agg atg ata gtt tat caa gaa      7892
Met Tyr Arg Asn Gln Ser Thr Ile Thr Arg Met Ile Val Tyr Gln Glu
                265                 270                 275
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144

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agt att att gaa gtt cta aaa gga aat att tta ttt gga cag ggt ata      7940
Ser Ile Ile Glu Val Leu Lys Gly Asn Ile Leu Phe Gly Gln Gly Ile
        280                 285                 290

agg att cca tca agt gaa gga ata ttc cta gga tcg cat tct act tat      7988
Arg Ile Pro Ser Ser Glu Gly Ile Phe Leu Gly Ser His Ser Thr Tyr
        295                 300                 305

att agt gtc ttt tac agg act tct tta tta gga att gtt ctt tat ttt      8036
Ile Ser Val Phe Tyr Arg Thr Ser Leu Leu Gly Ile Val Leu Tyr Phe
310                 315                 320                 325

tct gcc ttt ata ctt tta tat aaa gaa gcg att tca aaa aat tat aaa      8084
Ser Ala Phe Ile Leu Leu Tyr Lys Glu Ala Ile Ser Lys Asn Tyr Lys
                330                 335                 340

atc tac aga tta ttt ttt tat acg tta tta tgt tac acg ctc ttt gag      8132
Ile Tyr Arg Leu Phe Phe Tyr Thr Leu Leu Cys Tyr Thr Leu Phe Glu
                345                 350                 355

gaa ata gat cct aat cat tgg agt att gta tta tta ttc tca act ttt      8180
Glu Ile Asp Pro Asn His Trp Ser Ile Val Leu Leu Phe Ser Thr Phe
        360                 365                 370

ggt ata gtg gga agg gct aaa aaa tga aagaaaaagt aacagtcatt           8227
Gly Ile Val Gly Arg Ala Lys Lys
        375                 380
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atacctatat acaactcaga agcatacctt aaagaatgtg tgcaatccgt actacaacag   8287

actcatccat tgatagaagt tatactaatt gatgatggat ccactgataa tagtggagaa   8347

atttgtgata atttatctca ggaagataat cgcatacttg tatttcataa aaaaaatgga   8407

ggggtctctt cggcaaggaa cctaggtcta gataaatcca caggagaatt cataacattt   8467

gtggatagtg atgattttgt agcaccgaat atgattgaaa taatgttaaa aaatttaatc   8527

actgagaatg ctgatatagc agaagtagat tttgatattt cgaatgagag agattataga   8587

aagaagaaaa gacgaaactt ttataaagtt tttaagaata ataactcttt gaaagaattt   8647

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ggtaacttga ggtttgatga gaacttaaaa attggtgagg atttactttt taattgcaaa   8767

ctcttatgtc aagagcaccg tatagtcgta gatacgactt cttccttata tacttatcga   8827

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atttttaatg aaataagtag tttggttcct gccagattag ctaattatgt tgaagcgaaa   8947

ttttaagag aaaagataaa gtgtctccga aaaatgtttg aattaggtag taatattgac    9007

aataaaatca agtacaacg agagatttt ttcaaagaca ttaaatcata cccgttctat     9067
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145

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aaagcggtca aatacttatc attaaaggga ttattaagct tttatttaat gaaatgttca   9127

cctaaactat atgttatggc atatagaaga tttcaaaaac agtagctgga gaaatttgga   9187

aagagaattt ataacttcat gataaagaaa attgaaaagg atttaataag tgtaattgta   9247

cctatttata atgttgaaga ttatttagtt gaatgtatag aaagccttat tgttcaaaca   9307

tatcgaaata ttgaaatatt attgattaat gatggttcga cggataattg tgcaacaatt   9367

gccaaagaat tttctgaaag agattgtaga gttatctata tagaaaagtc gaatggtggg   9427

ttgtcagaag ctagaaacta tggaatttat cattcaaagg gaaaatactt aacttttgtt   9487

gattcagatg ataaagtttc ctctgattac atagcgaatt tgtataatgc tattcaaaaa   9547

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aaagcatact aaaagctaa ttctataaca tacatagaca agcctctcta tcattatcgt   9847

atacgagtag gtagtatcat gaataatagt gataatgtta taattgctag aaagaaactt   9907

gatgttttat cagcattaga cgagcgaata aaacttataa caagtttacg taagtattcc   9967

gtttttttac aaaaaacaga aatatttat gtcaatcaat attttaggac taaaaaattt   10027

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acactatcac ggattatgaa acttgggtaa agatattaaa tgatcaggga ataagaactg   10387

aatcatttaa agagtttgct tatcgggagc agttacaaaa taaaaatatt gaagaagtga   10447

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146

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147

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148

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149

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tcgccaagat ttacaacctt tatactatcc gaacggcgct atttttattt ctaataaaga   16027

aacttactta agggaaaaaa gcttttcac ctctaggaca tatgcttatc aaatggcaaa     16087

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cttacctaac tttttgacag ctaatgtaac agaggctttt gtttctatag gggtaaatga   16387

tctcattaca ggttatagtg tggaagaaat attcagcaat ttccaaaaac tctactcatt   16447

attagctgag aataaaataa agatgagatt tacaactatt gcttacaccc tttttagaga   16507

aactgtcaat aatgcagata ttgagaaaat caatcaatgg ctaacagaat tttgttatca   16567

aaatcagatt ccactgttag atattaatag attttttatca aaggatggta atctaaatta   16627

tcatttaact agtgatggat tgcattttga ctcaagaggc taatgatttg taacaaagtc   16687

aatatcaatt atttgtagac gaagttaaaa ccttataata tttatttat aaaattattc     16747

atcttatttt ggcgatttca atagtgatat ggtatattta aagtaagcta cgtatagttt   16807

taccagtcag aaatagtaag gatggttgag tatgagagaa actgaaacac acgatcacca   16867

agcgctaatt caaaaattgt tagtcagtat tcattattta accttgtttc gtgatgaaat   16927

tatattagta gaaaaaaccc catctttact ggggaaacat ttttctattg ctattgtgca   16987

gaatgaacta ggtgagatac tttctaaaat agaagctttg agtaagcaaa aaaaactgat   17047

tcgttctatt tattggtatg atgaatcgtc atttaaagtc atgaataagg ctctggctat   17107

tgtagaagaa tggattaagg gcttagataa tcttttagaa ttctgtcaat cacagacggt   17167

ttttcaagca attttaggtg atgaacgtgc acatgtattt ggaatcctta ttgatgttta   17227

tacttctttta aacattataa atacttcttt gaaagaagaa aattctaga              17276
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150

<210> 84
<211> 381
<212> PRT
<213> Streptococcus agalactiae

<400> 84

Met Arg Lys Tyr Leu Asp Leu Asp Tyr Ser Leu Phe Tyr Ala Leu Trp
1   5   10   15

Val Leu Ile Leu Val Pro Asn Gln Trp Tyr Gln Phe Leu Ile Ile Thr
            20   25   30

Ile Ile Val Leu Leu Leu Leu Trp Lys Ser Glu Phe Arg Ile Ser Ile
        35   40   45

Ser Asn Ser Ser Ile Leu Phe Leu Leu Trp Leu Phe Ile Tyr Leu Phe
        50   55   60

Ala Ile Leu Ile Arg Gly Thr Gln Glu Asp Ile Thr Phe Gln Arg Phe
65   70   75   80

Ile Ala Glu Leu Leu Lys Leu Ile Ser Thr Gly Tyr Ala Leu Phe Phe
                85   90   95

Tyr Asn Tyr Tyr Arg Lys Ala Asp Phe Asn Ser Ser Val Val Arg Asn
            100   105   110

Val Val Lys Val Asn Tyr Phe Val Leu Phe Leu Ile Thr Val Leu Tyr
            115   120   125

Leu Phe Phe Pro Met Leu Lys Pro Thr Leu Phe Gly Arg Glu Leu Phe
        130   135   140

Ser Ile Glu Trp Phe Pro His Met Arg Ile Arg Leu Ala Ala Tyr Phe
145   150   155   160

Glu Tyr Ala Thr Leu Ile Gly Gln Phe Ile Leu Phe Ser Tyr Pro Ile
                165   170   175

Leu Phe Leu Lys Pro Gln Lys His Met Glu Asn Ile Leu Ile Ser Leu
            180   185   190

151

Leu Leu Thr Ile Cys Ser Tyr Phe Ser Gly Ala Arg Ile Leu Leu Val
        195   200   205

Cys Met Leu Val Leu Leu Ala Ser Leu Leu Leu Asp Tyr Ile Leu Phe
    210   215   220

Lys Thr Asn Leu Lys Leu Thr Lys Lys Asn Thr Phe Ile Leu Gly Met
225   230   235   240

Thr Phe Leu Phe Ile Thr Ala Cys Phe Ser Tyr Asn Ile Trp Ser Ile
            245   250   255

Ile Glu Lys Ile Ile Met Tyr Arg Asn Gln Ser Thr Ile Thr Arg Met
        260   265   270

Ile Val Tyr Gln Glu Ser Ile Ile Glu Val Leu Lys Gly Asn Ile Leu
        275   280   285

Phe Gly Gln Gly Ile Arg Ile Pro Ser Ser Glu Gly Ile Phe Leu Gly
    290   295   300

Ser His Ser Thr Tyr Ile Ser Val Phe Tyr Arg Thr Ser Leu Leu Gly
305   310   315   320

Ile Val Leu Tyr Phe Ser Ala Phe Ile Leu Leu Tyr Lys Glu Ala Ile
            325   330   335

Ser Lys Asn Tyr Lys Ile Tyr Arg Leu Phe Phe Tyr Thr Leu Leu Cys
            340   345   350

Tyr Thr Leu Phe Glu Glu Ile Asp Pro Asn His Trp Ser Ile Val Leu
        355   360   365

Leu Phe Ser Thr Phe Gly Ile Val Gly Arg Ala Lys Lys
    370   375   380

<210> 85
<211> 3042
<212> DNA
<213> Staphylococcus aureus

152

<220>
<221> CDS
<222> (149)..(2296)
<223>

<400> 85
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tctagttaat atatagttaa tgtcttttaa tattttgttt ctttaatgtg tagattgggc   120

aattacattt tggaggaatt aaaaaatt atg aaa aag caa ata att tcg cta   172
                                 Met Lys Lys Gln Ile Ile Ser Leu
                                 1   5

ggc gca tta gca gtt gca tct agc tta ttt aca tgg gat aac aaa gca   220
Gly Ala Leu Ala Val Ala Ser Ser Leu Phe Thr Trp Asp Asn Lys Ala
    10   15   20

gat gcg ata gta aca aag gat tat agc aaa gag tca aga gtg aat gag   268
Asp Ala Ile Val Thr Lys Asp Tyr Ser Lys Glu Ser Arg Val Asn Glu
25   30   35   40

aac agt aaa tat ggg aca tta att tca gac tgg tat tta aaa ggg aga   316
Asn Ser Lys Tyr Gly Thr Leu Ile Ser Asp Trp Tyr Leu Lys Gly Arg
                45   50   55

tta act agt cta gaa tct caa ttt atc aat gca ttg gat att tta gag   364
Leu Thr Ser Leu Glu Ser Gln Phe Ile Asn Ala Leu Asp Ile Leu Glu
                60   65   70

aca tat cat tat ggc gaa aaa gag tat aaa gat gca aaa gat aaa ttg   412
Thr Tyr His Tyr Gly Glu Lys Glu Tyr Lys Asp Ala Lys Asp Lys Leu
                75   80   85

atg aca aga att tta ggg gaa gac caa tac ctt tta gaa aga aaa aaa   460
Met Thr Arg Ile Leu Gly Glu Asp Gln Tyr Leu Leu Glu Arg Lys Lys
    90   95   100

gtg cag tat gag gaa tac aaa aaa tta tac caa aaa tat aaa gaa gag   508
Val Gln Tyr Glu Glu Tyr Lys Lys Leu Tyr Gln Lys Tyr Lys Glu Glu
105   110   115   120

aat cca acc tct aaa ggc tta aaa ctg aaa aca ttc gat caa tat aca   556
Asn Pro Thr Ser Lys Gly Leu Lys Leu Lys Thr Phe Asp Gln Tyr Thr
                125   130   135

ata gaa gat tta act atg agg gaa tat aat gag tta aca gaa tca tta   604
Ile Glu Asp Leu Thr Met Arg Glu Tyr Asn Glu Leu Thr Glu Ser Leu
                140   145   150

aaa agt gct gta aaa gac ttt gag aaa gat gtt gaa aaa ata gaa aat   652
Lys Ser Ala Val Lys Asp Phe Glu Lys Asp Val Glu Lys Ile Glu Asn
                155   160   165

153

```
caa cat cat gat ttg aaa cca ttt act gat gaa atg gaa gag aag gct      700
Gln His His Asp Leu Lys Pro Phe Thr Asp Glu Met Glu Glu Lys Ala
    170             175             180

act tct aga gtt gat gat tta gca aat aaa gca tat agt gtt tat ttt      748
Thr Ser Arg Val Asp Asp Leu Ala Asn Lys Ala Tyr Ser Val Tyr Phe
185             190             195             200

gca ttt gtt agg gat aca caa cat aaa act gag gca tta gag tta aaa      796
Ala Phe Val Arg Asp Thr Gln His Lys Thr Glu Ala Leu Glu Leu Lys
                205             210             215

gcg aaa gta gat tta gtt tta ggt gat gag gat aaa ccg cat cgt att     844
Ala Lys Val Asp Leu Val Leu Gly Asp Glu Asp Lys Pro His Arg Ile
                220             225             230

tct aat gaa aga att gaa aaa gaa atg ata aaa gat tta gaa tct att      892
Ser Asn Glu Arg Ile Glu Lys Glu Met Ile Lys Asp Leu Glu Ser Ile
            235             240             245

att gaa gat ttc ttt ata gaa act ggt tta aat aag cct ggt aat att     940
Ile Glu Asp Phe Phe Ile Glu Thr Gly Leu Asn Lys Pro Gly Asn Ile
    250             255             260

acg agt tat gat agt agt aaa cat cac tat aaa aat cac agt gaa ggt     988
Thr Ser Tyr Asp Ser Ser Lys His His Tyr Lys Asn His Ser Glu Gly
265             270             275             280

ttt gag gct cta gtc aaa gaa aca aga gaa gca gta gca aac gct gac    1036
Phe Glu Ala Leu Val Lys Glu Thr Arg Glu Ala Val Ala Asn Ala Asp
                285             290             295

gaa tct tgg aaa act aaa act gta aaa aaa tac ggt gaa tct gaa aca    1084
Glu Ser Trp Lys Thr Lys Thr Val Lys Lys Tyr Gly Glu Ser Glu Thr
            300             305             310

aaa tct cct gtt gta aaa gaa gag aac aaa gtt gaa gac cct caa tca    1132
Lys Ser Pro Val Val Lys Glu Glu Asn Lys Val Glu Asp Pro Gln Ser
            315             320             325

cct aaa ttt gat aac caa caa gag gtt aaa act acg gct ggt aaa gct    1180
Pro Lys Phe Asp Asn Gln Gln Glu Val Lys Thr Thr Ala Gly Lys Ala
            330             335             340

gaa gaa aca aca caa cca gtt gca caa cca tta gtt aaa att cca cag    1228
Glu Glu Thr Thr Gln Pro Val Ala Gln Pro Leu Val Lys Ile Pro Gln
345                 350             355             360

ggc aca att aca ggt gaa att gtg aaa ggt ccg gaa tat cca acg atg    1276
Gly Thr Ile Thr Gly Glu Ile Val Lys Gly Pro Glu Tyr Pro Thr Met
                365             370             375

gaa aat aaa acg tta caa ggt gaa atc gtt caa ggt cca gat ttc cca    1324
Glu Asn Lys Thr Leu Gln Gly Glu Ile Val Gln Gly Pro Asp Phe Pro
            380             385             390
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154

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aca atg gaa caa agc ggt cca tct tta agc gac aat tat act caa ccg     1372
Thr Met Glu Gln Ser Gly Pro Ser Leu Ser Asp Asn Tyr Thr Gln Pro
        395                 400                 405

acg aca ccg aac cct att tta gaa ggt ctt gaa ggt agc tca tct aaa     1420
Thr Thr Pro Asn Pro Ile Leu Glu Gly Leu Glu Gly Ser Ser Ser Lys
        410                 415                 420

ctt gaa ata aaa cca caa ggt act gaa tca acg ttg aaa ggt att caa     1468
Leu Glu Ile Lys Pro Gln Gly Thr Glu Ser Thr Leu Lys Gly Ile Gln
425                 430                 435                 440

gga gaa tca agt gat att gaa gtt aaa cct caa gca act gaa aca aca     1516
Gly Glu Ser Ser Asp Ile Glu Val Lys Pro Gln Ala Thr Glu Thr Thr
                445                 450                 455

gaa gct tct caa tat ggt ccg aga ccg caa ttt aac aaa aca cct aag     1564
Glu Ala Ser Gln Tyr Gly Pro Arg Pro Gln Phe Asn Lys Thr Pro Lys
                460                 465                 470

tat gtg aaa tat aga gat gct ggt aca ggt att cgt gaa tac aac gat     1612
Tyr Val Lys Tyr Arg Asp Ala Gly Thr Gly Ile Arg Glu Tyr Asn Asp
                475                 480                 485

gga aca ttt gga tat gaa gcg aga cca aga ttc aac aag cca tca gaa     1660
Gly Thr Phe Gly Tyr Glu Ala Arg Pro Arg Phe Asn Lys Pro Ser Glu
        490                 495                 500

aca aac gca tac aac gta acg aca aat caa gat ggc aca gta tca tac     1708
Thr Asn Ala Tyr Asn Val Thr Thr Asn Gln Asp Gly Thr Val Ser Tyr
505                 510                 515                 520

ggc gcc cgc cca aca caa aac aag gca tca gaa aca aac gca tat aac     1756
Gly Ala Arg Pro Thr Gln Asn Lys Ala Ser Glu Thr Asn Ala Tyr Asn
                525                 530                 535

gta aca aca cat gca aac ggc caa gta tca tac gga gct cgc cca aca     1804
Val Thr Thr His Ala Asn Gly Gln Val Ser Tyr Gly Ala Arg Pro Thr
                540                 545                 550

caa aag aag cca agc gaa aca aat gca tat aac gta aca aca cat gca     1852
Gln Lys Lys Pro Ser Glu Thr Asn Ala Tyr Asn Val Thr Thr His Ala
        555                 560                 565

aac ggc caa gta tca tat ggc gcc cgc ccg aca tac aac aag cca agc     1900
Asn Gly Gln Val Ser Tyr Gly Ala Arg Pro Thr Tyr Asn Lys Pro Ser
        570                 575                 580

gaa aca aat gca tat aac gta aca aca cac gga aat ggc caa gta tca     1948
Glu Thr Asn Ala Tyr Asn Val Thr Thr His Gly Asn Gly Gln Val Ser
585                 590                 595                 600

tat gga gct cgt ccg aca tac aag aaa cca agt aaa aca aat gca tat     1996
Tyr Gly Ala Arg Pro Thr Tyr Lys Lys Pro Ser Lys Thr Asn Ala Tyr
                605                 610                 615
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155

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aac gta aca aca cat gca aac ggc caa gtg tca tac gga gct cgc cca        2044
Asn Val Thr Thr His Ala Asn Gly Gln Val Ser Tyr Gly Ala Arg Pro
            620                 625                 630

aca caa aac aag cca agc gaa aca aac gca tat aac gta aca aca cat        2092
Thr Gln Asn Lys Pro Ser Glu Thr Asn Ala Tyr Asn Val Thr Thr His
            635                 640                 645

gca aat ggc caa gta tca tac gga gct cgc cca aca caa aac aag cca        2140
Ala Asn Gly Gln Val Ser Tyr Gly Ala Arg Pro Thr Gln Asn Lys Pro
    650                 655                 660

agc gaa aca aac gca tat aac gta aca aca cac gga aac ggt caa gtg       2188
Ser Glu Thr Asn Ala Tyr Asn Val Thr Thr His Gly Asn Gly Gln Val
665             670                 675                 680

tca tac ggc gct cgt ccg aca tac aac aag cca agt aaa aca aat gca       2236
Ser Tyr Gly Ala Arg Pro Thr Tyr Asn Lys Pro Ser Lys Thr Asn Ala
                685                 690                 695

tac aat gta aca aca cat gca gat ggt act gcg aca tat ggt cct aga       2284
Tyr Asn Val Thr Thr His Ala Asp Gly Thr Ala Thr Tyr Gly Pro Arg
                700                 705                 710

gta aca aaa taa gtttataact ctatccatag acatacagtc aatacaatac          2336
Val Thr Lys
            715

aaaacattac gtatctttac aacagtaatc atgcattcta tgatgcttct aactgaatta    2396

aagcatcgaa caatcgaaag catatttcta aattatttat tcattatagt cttaaacata    2456

acatgaccta atatattact aacctattaa aataaaccac gcacatctat gtgatatacg    2516

acaatcacag caataataat tgctttagaa agtcgtaccg aactggaact tacaagtcta    2576

gttcgaacac actgatgtga gtggttttct ttattttaaa catgaacaat cagataagtt    2636

actagcatta gcaaatatta ttaaatcaaa gggcttcgat tcataaaatt taaaacaatg    2696

attaaaatta gacgtgtaaa tgttaaattc taaaacggaa atacccgcta tcctattaaa    2756

ccactttttg gttcaatcac tatatttcac acagcttcaa taataaaacg aaactgcttc    2816

aatccgcttc aacttcaacc tacctcattc agtaaccaaa cgaatccgct tcatccaaaa    2876

tcaaccattc taacgcacat actcaaatat agcagctgca cccataccga caccaataca    2936

catcgtaacc atgccgtaac ggctatcggg acgtctaccc atttcattaa gtaaacgcgc    2996

ggttaacatt gctcctgtag cacctaatgg atgacctaaa gcaata                   3042
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156

<210> 86
<211> 715
<212> PRT
<213> Staphylococcus aureus

<400> 86

Met Lys Lys Gln Ile Ile Ser Leu Gly Ala Leu Ala Val Ala Ser Ser
1   5   10   15

Leu Phe Thr Trp Asp Asn Lys Ala Asp Ala Ile Val Thr Lys Asp Tyr
            20   25   30

Ser Lys Glu Ser Arg Val Asn Glu Asn Ser Lys Tyr Gly Thr Leu Ile
        35   40   45

Ser Asp Trp Tyr Leu Lys Gly Arg Leu Thr Ser Leu Glu Ser Gln Phe
    50   55   60

Ile Asn Ala Leu Asp Ile Leu Glu Thr Tyr His Tyr Gly Glu Lys Glu
65   70   75   80

Tyr Lys Asp Ala Lys Asp Lys Leu Met Thr Arg Ile Leu Gly Glu Asp
                85   90   95

Gln Tyr Leu Leu Glu Arg Lys Lys Val Gln Tyr Glu Glu Tyr Lys Lys
            100   105   110

Leu Tyr Gln Lys Tyr Lys Glu Glu Asn Pro Thr Ser Lys Gly Leu Lys
        115   120   125

Leu Lys Thr Phe Asp Gln Tyr Thr Ile Glu Asp Leu Thr Met Arg Glu
    130   135   140

Tyr Asn Glu Leu Thr Glu Ser Leu Lys Ser Ala Val Lys Asp Phe Glu
145   150   155   160

Lys Asp Val Glu Lys Ile Glu Asn Gln His His Asp Leu Lys Pro Phe
                165   170   175

Thr Asp Glu Met Glu Glu Lys Ala Thr Ser Arg Val Asp Asp Leu Ala
            180   185   190

157

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Asn Lys Ala Tyr Ser Val Tyr Phe Ala Phe Val Arg Asp Thr Gln His
        195             200             205

Lys Thr Glu Ala Leu Glu Leu Lys Ala Lys Val Asp Leu Val Leu Gly
    210             215             220

Asp Glu Asp Lys Pro His Arg Ile Ser Asn Glu Arg Ile Glu Lys Glu
225             230             235             240

Met Ile Lys Asp Leu Glu Ser Ile Ile Glu Asp Phe Phe Ile Glu Thr
            245             250             255

Gly Leu Asn Lys Pro Gly Asn Ile Thr Ser Tyr Asp Ser Ser Lys His
        260             265             270

His Tyr Lys Asn His Ser Glu Gly Phe Glu Ala Leu Val Lys Glu Thr
        275             280             285

Arg Glu Ala Val Ala Asn Ala Asp Glu Ser Trp Lys Thr Lys Thr Val
    290             295             300

Lys Lys Tyr Gly Glu Ser Glu Thr Lys Ser Pro Val Val Lys Glu Glu
305             310             315             320

Asn Lys Val Glu Asp Pro Gln Ser Pro Lys Phe Asp Asn Gln Gln Glu
            325             330             335

Val Lys Thr Thr Ala Gly Lys Ala Glu Glu Thr Thr Gln Pro Val Ala
        340             345             350

Gln Pro Leu Val Lys Ile Pro Gln Gly Thr Ile Thr Gly Glu Ile Val
        355             360             365

Lys Gly Pro Glu Tyr Pro Thr Met Glu Asn Lys Thr Leu Gln Gly Glu
    370             375             380

Ile Val Gln Gly Pro Asp Phe Pro Thr Met Glu Gln Ser Gly Pro Ser
385             390             395             400

Leu Ser Asp Asn Tyr Thr Gln Pro Thr Thr Pro Asn Pro Ile Leu Glu
            405             410             415
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158

Gly Leu Glu Gly Ser Ser Ser Lys Leu Glu Ile Lys Pro Gln Gly Thr
        420   425   430

Glu Ser Thr Leu Lys Gly Ile Gln Gly Glu Ser Ser Asp Ile Glu Val
        435   440   445

Lys Pro Gln Ala Thr Glu Thr Thr Glu Ala Ser Gln Tyr Gly Pro Arg
    450   455   460

Pro Gln Phe Asn Lys Thr Pro Lys Tyr Val Lys Tyr Arg Asp Ala Gly
465   470   475   480

Thr Gly Ile Arg Glu Tyr Asn Asp Gly Thr Phe Gly Tyr Glu Ala Arg
            485   490   495

Pro Arg Phe Asn Lys Pro Ser Glu Thr Asn Ala Tyr Asn Val Thr Thr
        500   505   510

Asn Gln Asp Gly Thr Val Ser Tyr Gly Ala Arg Pro Thr Gln Asn Lys
        515   520   525

Ala Ser Glu Thr Asn Ala Tyr Asn Val Thr Thr His Ala Asn Gly Gln
    530   535   540

Val Ser Tyr Gly Ala Arg Pro Thr Gln Lys Lys Pro Ser Glu Thr Asn
545   550   555   560

Ala Tyr Asn Val Thr Thr His Ala Asn Gly Gln Val Ser Tyr Gly Ala
            565   570   575

Arg Pro Thr Tyr Asn Lys Pro Ser Glu Thr Asn Ala Tyr Asn Val Thr
            580   585   590

Thr His Gly Asn Gly Gln Val Ser Tyr Gly Ala Arg Pro Thr Tyr Lys
        595   600   605

Lys Pro Ser Lys Thr Asn Ala Tyr Asn Val Thr Thr His Ala Asn Gly
    610   615   620

Gln Val Ser Tyr Gly Ala Arg Pro Thr Gln Asn Lys Pro Ser Glu Thr
625   630   635   640

159

Asn Ala Tyr Asn Val Thr Thr His Ala Asn Gly Gln Val Ser Tyr Gly
            645   650   655

Ala Arg Pro Thr Gln Asn Lys Pro Ser Glu Thr Asn Ala Tyr Asn Val
            660   665   670

Thr Thr His Gly Asn Gly Gln Val Ser Tyr Gly Ala Arg Pro Thr Tyr
        675   680   685

Asn Lys Pro Ser Lys Thr Asn Ala Tyr Asn Val Thr Thr His Ala Asp
 690   695   700

Gly Thr Ala Thr Tyr Gly Pro Arg Val Thr Lys
705   710   715

<210> 87
<211> 2252
<212> DNA
<213> Staphylococcus aureus

<220>
<221> CDS
<222> (698)..(2224)
<223>

<400> 87
gaattcacaa ttctagctat tatcacttct caaaataaaa acatcgttct tcttaaagat   60

ttaattgaaa caatccacca taaataccct caaactgtta gagctctcaa taatttaaaa   120

aagcaaggct atctaataaa agaacggctc aactgaagat gaaagaaaaa ttttaattca   180

tatgaatgac gcgcagcaag accatgctga caattatta gctcaagtga atcaattatt   240

ggcagataaa aatcatttac atcttgtttt tgaataatat ctctattacg caagtgtgct   300

gtattctaaa gtgccattgt gttttctatt ttttaataaa acctcagcac attatgaaca   360

actttctatt ttctatatct cttaaaacca ttccgaaat taaacctcag cacattcaaa   420

attccatttt attcttaaaa atattttta actcatatgt aataaaccgc tttcattata   480

aaaaatatct atatatttta tctgtttta ttaatcggaa tagcgtgatt ttgcggtttt   540

aagcctttta cttcctgaat aaatctttgg acaaaattt tattttataa gttgtaaaac   600

ttacctttaa atttaattat aaatatagat tttagtattg caatacataa ttcgttatat   660

160

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tatgatgact ttacaaatac atacagggggg tattaat ttg aaa aag aaa aac att     715
                                           Leu Lys Lys Lys Asn Ile
                                            1               5


tat tca att cgt aaa cta ggt gta ggt att gca tct gta act tta ggt     763
Tyr Ser Ile Arg Lys Leu Gly Val Gly Ile Ala Ser Val Thr Leu Gly
            10              15              20


aca tta ctt ata tct ggt ggc gta aca cct gct gca aat gct gcg caa     811
Thr Leu Leu Ile Ser Gly Gly Val Thr Pro Ala Ala Asn Ala Ala Gln
        25              30              35


cac gat gaa gct caa caa aat gct ttt tat caa gtg tta aat atg cct     859
His Asp Glu Ala Gln Gln Asn Ala Phe Tyr Gln Val Leu Asn Met Pro
        40              45              50


aac tta aac gct gat caa cgt aat ggt ttt atc caa agc ctt aaa gat     907
Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp
55              60              65              70


gat cca agc caa agt gct aac gtt tta ggt gaa gct caa aaa ctt aat     955
Asp Pro Ser Gln Ser Ala Asn Val Leu Gly Glu Ala Gln Lys Leu Asn
                75              80              85


gac tct caa gct cca aaa gct gat gcg caa caa aat aag ttc aac aaa     1003
Asp Ser Gln Ala Pro Lys Ala Asp Ala Gln Gln Asn Lys Phe Asn Lys
            90              95              100


gat caa caa agc gcc ttc tat gaa atc ttg aac atg cct aac tta aac     1051
Asp Gln Gln Ser Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn
            105             110             115


gaa gag caa cgc aat ggt ttc att caa agt ctt aaa gac gat cca agc     1099
Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser
        120             125             130


caa agc act aac gtt tta ggt gaa gct aaa aaa tta aac gaa tct caa     1147
Gln Ser Thr Asn Val Leu Gly Glu Ala Lys Lys Leu Asn Glu Ser Gln
135             140             145             150


gca ccg aaa gct gac aac aat ttc aac aaa gaa caa caa aat gct ttc     1195
Ala Pro Lys Ala Asp Asn Asn Phe Asn Lys Glu Gln Gln Asn Ala Phe
                155             160             165


tat gaa atc ttg aac atg cct aac ttg aac gaa gaa caa cgc aat ggt     1243
Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly
            170             175             180


ttc atc caa agc tta aaa gat gac cca agt caa agt gct aac ctt tta     1291
Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu
            185             190             195


gca gaa gct aaa aag tta aat gaa tct caa gca ccg aaa gct gat aac     1339
Ala Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala Asp Asn
        200             205             210
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161

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aaa ttc aac aaa gaa caa caa aat gct ttc tat gaa atc tta cat tta        1387
Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His Leu
215                 220             225                 230

cct aac tta aat gaa gaa caa cgc aat ggt ttc atc caa agc tta aaa        1435
Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys
                235             240                 245

gat gac cca agc caa agc gct aac ctt tta gca gaa gct aaa aag cta        1483
Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala Lys Lys Leu
                250             255                 260

aat gat gca caa gca cca aaa gct gac aac aaa ttc aac aaa gaa caa        1531
Asn Asp Ala Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys Glu Gln
            265             270             275

caa aat gct ttc tat gaa att tta cat tta cct aac tta act gaa gaa        1579
Gln Asn Ala Phe Tyr Glu Ile Leu His Leu Pro Asn Leu Thr Glu Glu
        280             285             290

caa cgt aac ggc ttc atc caa agc ctt aaa gac gat cct tca gtg agc       1627
Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Val Ser
295             300             305             310

aaa gaa att tta gca gaa gct aaa aag cta aac gat gct caa gca cca        1675
Lys Glu Ile Leu Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln Ala Pro
                315                 320             325

aaa gag gaa gac aac aac aag cct ggt aaa gaa gac ggc aac aaa cct       1723
Lys Glu Glu Asp Asn Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro
                330             335             340

ggt aaa gaa gac ggc aac aaa cct ggt aaa gaa gac aac aaa aaa cct       1771
Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Asn Lys Lys Pro
            345             350             355

ggc aaa gaa gac ggc aac aaa cct ggt aaa gaa gac aac aaa aaa cct       1819
Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Asn Lys Lys Pro
        360             365             370

ggc aaa gaa gat ggc aac aaa cct ggt aaa gaa gac ggc aac aag cct       1867
Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro
375             380             385             390

ggt aaa gaa gat ggc aac aag cct ggt aaa gaa gat ggc aac aag cct       1915
Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro
            395             400             405

ggt aaa gaa gac ggc aac gga gta cat gtc gtt aaa cct ggt gat aca       1963
Gly Lys Glu Asp Gly Asn Gly Val His Val Val Lys Pro Gly Asp Thr
            410             415             420

gta aat gac att gca aaa gca aac ggc act act gct gac aaa att gct       2011
Val Asn Asp Ile Ala Lys Ala Asn Gly Thr Thr Ala Asp Lys Ile Ala
        425             430             435
```

162

```
gca gat aac aaa tta gct gat aaa aac atg atc aaa cct ggt caa gaa        2059
Ala Asp Asn Lys Leu Ala Asp Lys Asn Met Ile Lys Pro Gly Gln Glu
    440             445             450

ctt gtt gtt gat aag aag caa cca gca aac cat gca gat gct aac aaa        2107
Leu Val Val Asp Lys Lys Gln Pro Ala Asn His Ala Asp Ala Asn Lys
455             460             465             470

gct caa gca tta cca gaa act ggt gaa gaa aat cca ttc atc ggt aca        2155
Ala Gln Ala Leu Pro Glu Thr Gly Glu Glu Asn Pro Phe Ile Gly Thr
            475             480             485

act gta ttt ggt gga tta tca tta gcg tta ggt gca gcg tta tta gct        2203
Thr Val Phe Gly Gly Leu Ser Leu Ala Leu Gly Ala Ala Leu Leu Ala
            490             495             500

gga cgt cgt cgc gaa cta taa aaacaaacaa tacacaacga tagatatc            2252
Gly Arg Arg Arg Glu Leu
            505
```

<210> 88
<211> 508
<212> PRT
<213> Staphylococcus aureus

<400> 88

```
Leu Lys Lys Lys Asn Ile Tyr Ser Ile Arg Lys Leu Gly Val Gly Ile
1               5               10              15


Ala Ser Val Thr Leu Gly Thr Leu Leu Ile Ser Gly Gly Val Thr Pro
                20              25              30


Ala Ala Asn Ala Ala Gln His Asp Glu Ala Gln Gln Asn Ala Phe Tyr
            35              40              45


Gln Val Leu Asn Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe
        50              55              60


Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Val Leu Gly
65              70              75              80


Glu Ala Gln Lys Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Gln
                85              90              95


Gln Asn Lys Phe Asn Lys Asp Gln Gln Ser Ala Phe Tyr Glu Ile Leu
            100             105             110
```

163

```
Asn Met Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser
        115             120                 125

Leu Lys Asp Asp Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala Lys
        130             135                 140

Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala Asp Asn Asn Phe Asn Lys
145             150                 155                 160

Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn
                165                 170                 175

Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser
            180                 185                 190

Gln Ser Ala Asn Leu Leu Ala Glu Ala Lys Lys Leu Asn Glu Ser Gln
        195                 200                 205

Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe
    210                 215                 220

Tyr Glu Ile Leu His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly
225                 230                 235                 240

Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu
                245                 250                 255

Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala Asp Asn
            260                 265                 270

Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His Leu
        275                 280                 285

Pro Asn Leu Thr Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys
    290                 295                 300

Asp Asp Pro Ser Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys Leu
305                 310                 315                 320

Asn Asp Ala Gln Ala Pro Lys Glu Glu Asp Asn Asn Lys Pro Gly Lys
            325                 330                 335
```

164

Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys
            340   345   350

Glu Asp Asn Lys Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys
            355   360   365

Glu Asp Asn Lys Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys
        370   375   380

Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys
385   390   395   400

Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Gly Val His Val
                405   410   415

Val Lys Pro Gly Asp Thr Val Asn Asp Ile Ala Lys Ala Asn Gly Thr
            420   425   430

Thr Ala Asp Lys Ile Ala Ala Asp Asn Lys Leu Ala Asp Lys Asn Met
            435   440   445

Ile Lys Pro Gly Gln Glu Leu Val Val Asp Lys Lys Gln Pro Ala Asn
        450   455   460

His Ala Asp Ala Asn Lys Ala Gln Ala Leu Pro Glu Thr Gly Glu Glu
465   470   475   480

Asn Pro Phe Ile Gly Thr Thr Val Phe Gly Gly Leu Ser Leu Ala Leu
                485   490   495

Gly Ala Ala Leu Leu Ala Gly Arg Arg Arg Glu Leu
            500   505

<210> 89
<211> 324
<212> DNA
<213> Staphylococcus aureus

<220>
<221> CDS
<222> (1)..(306)
<223>

<220>
<221> CDS
<222> (310)..(315)
<223>

<400> 89

```
atg cgg ggt tct cat cat cat cat cat cat ggt atg gct agc atg act        48
Met Arg Gly Ser His His His His His His Gly Met Ala Ser Met Thr
1               5                   10                  15

ggt gga cag caa atg ggt cgg gat ctg tac gac gat gac gat aag gat        96
Gly Gly Gln Gln Met Gly Arg Asp Leu Tyr Asp Asp Asp Asp Lys Asp
                20                  25                  30

ccg agc tcg aga gga tcc aaa gct gat gcg caa caa aat aac ttc aac       144
Pro Ser Ser Arg Gly Ser Lys Ala Asp Ala Gln Gln Asn Asn Phe Asn
        35                  40                  45

aaa gat caa caa agc gcc ttc tat gaa atc ttg aac atg cct aac tta       192
Lys Asp Gln Gln Ser Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu
        50                  55                  60

aac gaa gcg caa cgc aac ggc ttc att caa agt ctt aaa gac gac cca       240
Asn Glu Ala Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro
65                  70                  75                  80

agc caa agc act aac gtt tta ggt gaa gct aaa aaa tta aac gaa tct       288
Ser Gln Ser Thr Asn Val Leu Gly Glu Ala Lys Lys Leu Asn Glu Ser
                85                  90                  95

caa gca ggg aaa cta gtt tag aaa gct tgatccggc                         324
Gln Ala Gly Lys Leu Val     Lys Ala
                100
```

<210> 90
<211> 104
<212> PRT
<213> Staphylococcus aureus

<400> 90

```
Met Arg Gly Ser His His His His His His Gly Met Ala Ser Met Thr
1               5                   10                  15

Gly Gly Gln Gln Met Gly Arg Asp Leu Tyr Asp Asp Asp Asp Lys Asp
                20                  25                  30

Pro Ser Ser Arg Gly Ser Lys Ala Asp Ala Gln Gln Asn Asn Phe Asn
        35                  40                  45
```

166

```
Lys Asp Gln Gln Ser Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu
    50              55              60


Asn Glu Ala Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro
65              70              75              80


Ser Gln Ser Thr Asn Val Leu Gly Glu Ala Lys Lys Leu Asn Glu Ser
                85              90              95


Gln Ala Gly Lys Leu Val Lys Ala
            100
```

<210> 91
<211> 60
<212> PRT
<213> Staphylococcus aureus

<400> 91

```
Thr Ala Asp Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu
1               5               10              15


Ile Leu His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile
            20              25              30


Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu
        35              40              45


Ala Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala
    50              55              60
```

<210> 92
<211> 2593
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (56)..(508)
<223>

<400> 92

```
agttgtcttt ggtagttttt tgcactaact tcaggaacca gctcatgatc tcagg atg        58
                                                              Met
                                                              1
```

167

```
tat gga aaa ata atc ttt gta tta cta ttg tca gca att gtg agc ata        106
Tyr Gly Lys Ile Ile Phe Val Leu Leu Leu Ser Ala Ile Val Ser Ile
        5                   10                  15

tca gca tca agt acc act ggt gtg gca atg cac act tca acc tct tct        154
Ser Ala Ser Ser Thr Thr Gly Val Ala Met His Thr Ser Thr Ser Ser
        20                  25                  30

tca gtc aca aag agt tac atc tca tca cag aca aat gat acg cac aaa        202
Ser Val Thr Lys Ser Tyr Ile Ser Ser Gln Thr Asn Asp Thr His Lys
        35                  40                  45

cgg gac aca tat gca gcc act cct aga gct cat gaa gtt tca gaa att        250
Arg Asp Thr Tyr Ala Ala Thr Pro Arg Ala His Glu Val Ser Glu Ile
50                  55                  60                  65

tct gtt aga act gtt tac cct cca gaa gag gaa acc gga gaa agg gta        298
Ser Val Arg Thr Val Tyr Pro Pro Glu Glu Glu Thr Gly Glu Arg Val
                70                  75                  80

caa ctt gcc cat cat ttc tct gaa cca gag ata aca ctc att att ttt        346
Gln Leu Ala His His Phe Ser Glu Pro Glu Ile Thr Leu Ile Ile Phe
                85                  90                  95

ggg gtg atg gct ggt gtt att gga acg atc ctc tta att tct tac ggt        394
Gly Val Met Ala Gly Val Ile Gly Thr Ile Leu Leu Ile Ser Tyr Gly
        100                 105                 110

att cgc cga ctg ata aag aaa agc cca tct gat gta aaa cct ctc ccc        442
Ile Arg Arg Leu Ile Lys Lys Ser Pro Ser Asp Val Lys Pro Leu Pro
        115                 120                 125

tca cct gac aca gac gtg cct tta agt tct gtt gaa ata gaa aat cca        490
Ser Pro Asp Thr Asp Val Pro Leu Ser Ser Val Glu Ile Glu Asn Pro
130                 135                 140                 145

gag aca agt gat caa tga gaatctgttc accaaaccaa atgtggaaag            538
Glu Thr Ser Asp Gln
                150

aacacaaaga agacataaga cttcagtcaa gtgaaaaatt aacatgtgga ctggacactc    598

caataaatta tatacctgcc taagttgtac aatttcagaa tgcaattttc attataatga    658

gttccagtga ctcaatgatg gggaaaaaaa tctctgctca ttaatatttc aagataaaga    718

acaaatgttt ccttgaatgc ttgctttgt gtgttagcat aatttttaga attgtttgag     778

aattctgatc caaaacttta gttgaattca tctacgtttg tttaatatta acttaccta     838

ttctattgta ttataatgat gattctgtca aatgaaaggc ttgaaatacc tagatgaagt    898

ttagattttc ttcctattgt aaactttga gtctggtttc attgttttaa ataaattaag     958

gggacactaa agtcctatca ttcattcctt cattctgaac aggcaagata taatattaca    1018
```

168

```
tgaatgatta ctatattttg ttcacactaa taaagcttat gctcagaaat gccatacaca    1078

cacacaaaca cacacattta tcatttaatg cataaatcaa cacaaaaggt tttcccatta    1138

atatgaaata ttacatatat ataagtgcca tatttaaaat aatttgtcta acagtagaac    1198

tatgtcggag cactcactga agcttcgatt tcccactgaa agagttattt gttgtaagta    1258

gagttatccc ggagaaggaa aaagaactta cgacctttct ttataacaga aagctcaact    1318

ctaaattcaa caagatgtgc aaaccggaca tgcaggtgaa tattttaata ggttactata    1378

aggttctcaa ttaaattctt taatctgtcc agtcccagtt tctcttatta ataaaacttt    1438

ggaaattgct ttaaaccatt taaaggaaat ttctagatat agaaactaaa ggactgtgac    1498

tatacagtgt cactcatttg tagtaaaact taaaaagcaa aaacaaaaaa caaaaaagac    1558

cttcctgtga tactttattt ccgaactaat aaaaatctat atgacttttt attattgtgt    1618

gataaccaag taaatgtttt ctattttcga tattttcagg catggtaaca gaaatttacc    1678

ttttaataaa ttaaaaaatc taaattttaa cctacttgta tgttcggaga gtgttttgt     1738

actatattga ctacttaaaa tagagaatga gactaagaag ggaacatttc tgttgataca    1798

tgtttttaa aagtaatttt taagagcatt attaggttaa tttaatccaa ttaatgaccc     1858

aaatgccaag gtaattttaa atttacattt ttaataaaag caacatgttg aaacaagaga    1918

gggtgagatt aaccttttg ctaaagtaat ttacaagtca aagacaggaa gagatcagag     1978

tgaatgtgcc ttcttaacca gagctacaga atttagtgaa taattaaagt acaaactgct    2038

ttgacctcct tgaacttttc caagcaattt ctctgtactt ctatatatga atgtcttagc    2098

caattttctg ctactataac agaatacgac agactgggta atttaaaaag aaaagaaatt    2158

tattttcttc ctagttctgg aggctgggaa ggcgaagggc atggcactga catctgcctt    2218

gtaactgatg agaaccttct tactgcatga taacaaagca gcaaggcaag caaaagcgta    2278

agatgaagag agaggaaatg aagccaaaca catcctttca tcagaagccc attccctcta    2338

taaggcgtta ctacatttat gagaatggag tcctcatgac ctaatcgtga ccttaaaggc    2398

ccctcccaac actgttacaa tggcaattaa atttcaacaa aggttccaga ggtgacattc    2458

gaatcagcaa tgaaattttc atagttaaat ttggtattcg tgggggaaga aatgaccatt    2518

tcccttgtat ttttataatt aaatcagcaa aatattgtaa taaagaaatc tttcctgtga    2578

agataccatg acccc                                                     2593
```

169

<210> 93
<211> 150
<212> PRT
<213> Homo sapiens

<400> 93

Met Tyr Gly Lys Ile Ile Phe Val Leu Leu Leu Ser Ala Ile Val Ser
1   5   10   15

Ile Ser Ala Ser Ser Thr Thr Gly Val Ala Met His Thr Ser Thr Ser
            20   25   30

Ser Ser Val Thr Lys Ser Tyr Ile Ser Ser Gln Thr Asn Asp Thr His
            35   40   45

Lys Arg Asp Thr Tyr Ala Ala Thr Pro Arg Ala His Glu Val Ser Glu
50   55   60

Ile Ser Val Arg Thr Val Tyr Pro Pro Glu Glu Glu Thr Gly Glu Arg
65   70   75   80

Val Gln Leu Ala His His Phe Ser Glu Pro Glu Ile Thr Leu Ile Ile
                85   90   95

Phe Gly Val Met Ala Gly Val Ile Gly Thr Ile Leu Leu Ile Ser Tyr
                100   105   110

Gly Ile Arg Arg Leu Ile Lys Lys Ser Pro Ser Asp Val Lys Pro Leu
                115   120   125

Pro Ser Pro Asp Thr Asp Val Pro Leu Ser Ser Val Glu Ile Glu Asn
            130   135   140

Pro Glu Thr Ser Asp Gln
145   150

<210> 94
<211> 5185
<212> DNA
<213> Homo sapiens

170

```
<220>
<221>  CDS
<222>  (104)..(4474)
<223>


<400>  94
gggaacttgg attaggtgga gaggcagttg gggggcctcg ttgttttgcg tcttagttcc      60

gccctcctgt ccatcaggag aaggaaagga taaaccctgg gcc atg agg cta ccc       115
                                                Met Arg Leu Pro
                                                1

ctg ctc ctg gtt ttt gcc tct gtc att ccg ggt gct gtt ctc cta ctg      163
Leu Leu Leu Val Phe Ala Ser Val Ile Pro Gly Ala Val Leu Leu Leu
5                   10              15                  20

gac acc agg caa ttt tta atc tat aat gaa gat cac aag cgc tgc gtg      211
Asp Thr Arg Gln Phe Leu Ile Tyr Asn Glu Asp His Lys Arg Cys Val
                25              30                  35

gat gca gtg agt ccc agt gcc gtc caa acc gca gct tgc aac cag gat      259
Asp Ala Val Ser Pro Ser Ala Val Gln Thr Ala Ala Cys Asn Gln Asp
            40              45                  50

gcc gaa tca cag aaa ttc cga tgg gtg tcc gaa tct cag att atg agt      307
Ala Glu Ser Gln Lys Phe Arg Trp Val Ser Glu Ser Gln Ile Met Ser
            55                  60                  65

gtt gca ttt aaa tta tgc ctg gga gtg cca tca aaa aca gac tgg gtt      355
Val Ala Phe Lys Leu Cys Leu Gly Val Pro Ser Lys Thr Asp Trp Val
        70              75                  80

gct atc act ctc tat gcc tgt gac tca aaa agt gaa ttt cag aaa tgg      403
Ala Ile Thr Leu Tyr Ala Cys Asp Ser Lys Ser Glu Phe Gln Lys Trp
85                  90                  95                  100

gag tgc aaa aat gac aca ctt ttg ggg atc aaa gga gaa gat tta ttt      451
Glu Cys Lys Asn Asp Thr Leu Leu Gly Ile Lys Gly Glu Asp Leu Phe
                105             110                 115

ttt aac tac ggc aac aga caa gaa aag aat att atg ctc tac aag gga      499
Phe Asn Tyr Gly Asn Arg Gln Glu Lys Asn Ile Met Leu Tyr Lys Gly
                120             125                 130

tcg ggt tta tgg agc agg tgg aag atc tat gga acc aca gac aat ctg      547
Ser Gly Leu Trp Ser Arg Trp Lys Ile Tyr Gly Thr Thr Asp Asn Leu
        135             140                 145

tgc tcc aga ggt tat gaa gcc atg tat acg cta cta ggc aat gcc aat      595
Cys Ser Arg Gly Tyr Glu Ala Met Tyr Thr Leu Leu Gly Asn Ala Asn
        150             155                 160

gga gca acc tgt gca ttc ccg ttc aag ttt gaa aac aag tgg tac gca      643
Gly Ala Thr Cys Ala Phe Pro Phe Lys Phe Glu Asn Lys Trp Tyr Ala
165             170                 175                 180
```

171

```
gat tgc acg agt gct ggg cgg tcg gat gga tgg ctc tgg tgc gga acc      691
Asp Cys Thr Ser Ala Gly Arg Ser Asp Gly Trp Leu Trp Cys Gly Thr
                185                 190                 195

act act gac tat gac aca gac aag cta ttt gga tat tgt cca ttg aaa      739
Thr Thr Asp Tyr Asp Thr Asp Lys Leu Phe Gly Tyr Cys Pro Leu Lys
                200                 205                 210

ttt gag ggc agt gaa agc tta tgg aat aaa gac ccg ctg acc agc gtt      787
Phe Glu Gly Ser Glu Ser Leu Trp Asn Lys Asp Pro Leu Thr Ser Val
                215                 220                 225

tcc tac cag ata aac tcc aaa tcc gct tta acg tgg cac caa gcg agg      835
Ser Tyr Gln Ile Asn Ser Lys Ser Ala Leu Thr Trp His Gln Ala Arg
                230                 235                 240

aaa agc tgc caa caa cag aac gct gag ctc ctg agc atc aca gag ata      883
Lys Ser Cys Gln Gln Gln Asn Ala Glu Leu Leu Ser Ile Thr Glu Ile
245                 250                 255                 260

cat gag caa aca tac ctg aca gga tta acc agt tcc ttg acc tca gga      931
His Glu Gln Thr Tyr Leu Thr Gly Leu Thr Ser Ser Leu Thr Ser Gly
                265                 270                 275

ctc tgg att gga ctt aac agt ctg agc ttc aac agc ggt tgg cag tgg      979
Leu Trp Ile Gly Leu Asn Ser Leu Ser Phe Asn Ser Gly Trp Gln Trp
                280                 285                 290

agt gac cgc agt cct ttc cga tat ttg aac tgg tta cca gga agt cca     1027
Ser Asp Arg Ser Pro Phe Arg Tyr Leu Asn Trp Leu Pro Gly Ser Pro
                295                 300                 305

tca gct gaa cct gga aaa agc tgt gtg tca cta aat cct gga aaa aat     1075
Ser Ala Glu Pro Gly Lys Ser Cys Val Ser Leu Asn Pro Gly Lys Asn
                310                 315                 320

gct aaa tgg gaa aat ctg gaa tgt gtt cag aaa ctg ggc tat att tgc     1123
Ala Lys Trp Glu Asn Leu Glu Cys Val Gln Lys Leu Gly Tyr Ile Cys
325                 330                 335                 340

aaa aag ggc aac acc act tta aat tct ttt gtt att ccc tca gaa agt     1171
Lys Lys Gly Asn Thr Thr Leu Asn Ser Phe Val Ile Pro Ser Glu Ser
                345                 350                 355

gat gtg cct act cac tgt cct agt cag tgg tgg ccg tat gcc ggt cac     1219
Asp Val Pro Thr His Cys Pro Ser Gln Trp Trp Pro Tyr Ala Gly His
                360                 365                 370

tgt tac aag att cac aga gat gag aaa aaa atc cag agg gat gct ctg     1267
Cys Tyr Lys Ile His Arg Asp Glu Lys Lys Ile Gln Arg Asp Ala Leu
                375                 380                 385

acc acc tgc agg aag gaa ggc ggt gac ctc aca agt atc cac acc atc     1315
Thr Thr Cys Arg Lys Glu Gly Gly Asp Leu Thr Ser Ile His Thr Ile
                390                 395                 400
```

172

```
gag gaa ttg gac ttt att atc tcc cag cta gga tat gag cca aat gac    1363
Glu Glu Leu Asp Phe Ile Ile Ser Gln Leu Gly Tyr Glu Pro Asn Asp
405                 410             415                 420

gaa ttg tgg atc ggc tta aat gac att aag att caa atg tac ttt gag    1411
Glu Leu Trp Ile Gly Leu Asn Asp Ile Lys Ile Gln Met Tyr Phe Glu
                425             430                 435

tgg agt gat ggg acc cct gta acg ttt acc aaa tgg ctt cgt gga gaa    1459
Trp Ser Asp Gly Thr Pro Val Thr Phe Thr Lys Trp Leu Arg Gly Glu
                440             445                 450

cca agc cat gaa aac aac aga cag gag gat tgt gtg gtg atg aaa ggc    1507
Pro Ser His Glu Asn Asn Arg Gln Glu Asp Cys Val Val Met Lys Gly
            455             460             465

aag gat ggg tac tgg gca gat cgg ggc tgt gag tgg cct ctt ggc tac    1555
Lys Asp Gly Tyr Trp Ala Asp Arg Gly Cys Glu Trp Pro Leu Gly Tyr
            470             475             480

atc tgc aag atg aaa tca cga agc caa ggt cca gaa ata gtg gaa gtc    1603
Ile Cys Lys Met Lys Ser Arg Ser Gln Gly Pro Glu Ile Val Glu Val
485                 490             495                 500

gaa aaa ggc tgc agg aaa ggc tgg aaa aaa cat cac ttt tac tgc tat    1651
Glu Lys Gly Cys Arg Lys Gly Trp Lys Lys His His Phe Tyr Cys Tyr
                505             510             515

atg att gga cat acg ctt tca aca ttt gca gaa gca aac caa acc tgt    1699
Met Ile Gly His Thr Leu Ser Thr Phe Ala Glu Ala Asn Gln Thr Cys
                520             525             530

aat aat gag aat gct tat tta aca act att gaa gac aga tat gaa caa    1747
Asn Asn Glu Asn Ala Tyr Leu Thr Thr Ile Glu Asp Arg Tyr Glu Gln
            535             540             545

gcc ttc ctg act agt ttc gtt ggc tta agg cct gaa aaa tat ttc tgg    1795
Ala Phe Leu Thr Ser Phe Val Gly Leu Arg Pro Glu Lys Tyr Phe Trp
            550             555             560

aca gga ctt tca gat ata caa acc aaa ggg act ttt cag tgg acc atc    1843
Thr Gly Leu Ser Asp Ile Gln Thr Lys Gly Thr Phe Gln Trp Thr Ile
565                 570             575                 580

gag gaa gag gtt cgg ttc acc cac tgg aat tca gat atg cca ggg cga    1891
Glu Glu Glu Val Arg Phe Thr His Trp Asn Ser Asp Met Pro Gly Arg
                585             590                 595

aag cca ggg tgt gtt gcc atg aga acc ggg att gca ggg ggc tta tgg    1939
Lys Pro Gly Cys Val Ala Met Arg Thr Gly Ile Ala Gly Gly Leu Trp
                600             605                 610

gat gtt ttg aaa tgt gat gaa aag gca aaa ttt gtg tgc aag cac tgg    1987
Asp Val Leu Lys Cys Asp Glu Lys Ala Lys Phe Val Cys Lys His Trp
            615             620             625
```

173

```
gca gaa gga gta acc cac cca ccg aag ccc acg acg act ccc gaa ccc     2035
Ala Glu Gly Val Thr His Pro Pro Lys Pro Thr Thr Thr Pro Glu Pro
    630             635             640

aaa tgt ccg gag gat tgg ggc gcc agc agt aga aca agc ttg tgt ttc     2083
Lys Cys Pro Glu Asp Trp Gly Ala Ser Ser Arg Thr Ser Leu Cys Phe
645             650             655             660

aag ctg tat gca aaa gga aaa cat gag aag aaa acg tgg ttt gaa tct     2131
Lys Leu Tyr Ala Lys Gly Lys His Glu Lys Lys Thr Trp Phe Glu Ser
                665             670             675

cga gat ttt tgt cga gct ctg ggt gga gac tta gct agc atc aat aac     2179
Arg Asp Phe Cys Arg Ala Leu Gly Gly Asp Leu Ala Ser Ile Asn Asn
            680             685             690

aaa gag gaa cag caa aca ata tgg cga tta ata aca gct agt gga agc     2227
Lys Glu Glu Gln Gln Thr Ile Trp Arg Leu Ile Thr Ala Ser Gly Ser
        695             700             705

tac cac aaa ctg ttt tgg ttg gga ttg aca tat gga agc cct tca gaa     2275
Tyr His Lys Leu Phe Trp Leu Gly Leu Thr Tyr Gly Ser Pro Ser Glu
    710             715             720

ggt ttt act tgg agt gat ggt tct cct gtt tca tat gaa aac tgg gct     2323
Gly Phe Thr Trp Ser Asp Gly Ser Pro Val Ser Tyr Glu Asn Trp Ala
725             730             735             740

tat gga gaa cct aat aat tat caa aat gtt gaa tac tgt ggt gag ctg     2371
Tyr Gly Glu Pro Asn Asn Tyr Gln Asn Val Glu Tyr Cys Gly Glu Leu
                745             750             755

aaa ggt gac cct act atg tct tgg aat gat att aat tgt gaa cac ctt     2419
Lys Gly Asp Pro Thr Met Ser Trp Asn Asp Ile Asn Cys Glu His Leu
                760             765             770

aac aac tgg att tgc cag ata caa aaa gga caa aca cca aaa cct gag     2467
Asn Asn Trp Ile Cys Gln Ile Gln Lys Gly Gln Thr Pro Lys Pro Glu
            775             780             785

cca aca cca gct cct caa gac aat cca cca gtt act gaa gat ggg tgg     2515
Pro Thr Pro Ala Pro Gln Asp Asn Pro Pro Val Thr Glu Asp Gly Trp
    790             795             800

gtt att tac aaa gac tac cag tat tat ttc agc aaa gag aag gaa acc     2563
Val Ile Tyr Lys Asp Tyr Gln Tyr Tyr Phe Ser Lys Glu Lys Glu Thr
805             810             815             820

atg gac aat gcg cga gcg ttt tgc aag agg aat ttt ggt gat ctt gtt     2611
Met Asp Asn Ala Arg Ala Phe Cys Lys Arg Asn Phe Gly Asp Leu Val
                825             830             835

tct att caa agt gaa agt gaa aag aag ttt cta tgg aaa tat gta aac     2659
Ser Ile Gln Ser Glu Ser Glu Lys Lys Phe Leu Trp Lys Tyr Val Asn
            840             845             850
```

174

```
aga aat gat gca cag tct gca tat ttt att ggt tta ttg atc agc ttg      2707
Arg Asn Asp Ala Gln Ser Ala Tyr Phe Ile Gly Leu Leu Ile Ser Leu
        855             860             865

gat aaa aag ttt gct tgg atg gat gga agc aaa gtg gat tac gtg tct      2755
Asp Lys Lys Phe Ala Trp Met Asp Gly Ser Lys Val Asp Tyr Val Ser
        870             875             880

tgg gcc aca ggt gaa ccc aat ttt gca aat gaa gat gaa aac tgt gtg      2803
Trp Ala Thr Gly Glu Pro Asn Phe Ala Asn Glu Asp Glu Asn Cys Val
885             890             895             900

acc atg tat tca aat tca ggg ttt tgg aat gac att aac tgt ggc tat      2851
Thr Met Tyr Ser Asn Ser Gly Phe Trp Asn Asp Ile Asn Cys Gly Tyr
                905             910             915

cca aac gcc ttc att tgc cag cga cat aac agt agt atc aat gct acc      2899
Pro Asn Ala Phe Ile Cys Gln Arg His Asn Ser Ser Ile Asn Ala Thr
        920             925             930

aca gtt atg cct acc atg ccc tcg gtc cca tca ggg tgc aag gaa ggt      2947
Thr Val Met Pro Thr Met Pro Ser Val Pro Ser Gly Cys Lys Glu Gly
        935             940             945

tgg aat ttc tac agc aac aag tgt ttc aaa atc ttt gga ttt atg gaa      2995
Trp Asn Phe Tyr Ser Asn Lys Cys Phe Lys Ile Phe Gly Phe Met Glu
    950             955             960

gaa gaa aga aaa aat tgg caa gag gca cga aaa gct tgt ata ggc ttt      3043
Glu Glu Arg Lys Asn Trp Gln Glu Ala Arg Lys Ala Cys Ile Gly Phe
965             970             975             980

gga ggg aat ctg gtc tcc ata caa aat gaa aaa gag caa gca ttt ctt      3091
Gly Gly Asn Leu Val Ser Ile Gln Asn Glu Lys Glu Gln Ala Phe Leu
            985             990             995

acc tat cac atg  aag gac tcc act ttc  agt gcc tgg act ggg  ctg      3136
Thr Tyr His Met  Lys Asp Ser Thr Phe  Ser Ala Trp Thr Gly  Leu
            1000            1005            1010

aat gat gtc aat  tca gaa cac acg ttc  ctt tgg acg gat gga  cga      3181
Asn Asp Val Asn  Ser Glu His Thr Phe  Leu Trp Thr Asp Gly  Arg
            1015            1020            1025

gga gtc cat tac  aca aac tgg ggg aaa  ggt tac cct ggt gga  aga      3226
Gly Val His Tyr  Thr Asn Trp Gly Lys  Gly Tyr Pro Gly Gly  Arg
            1030            1035            1040

aga agc agt ctt  tct tat gaa gat gct  gac tgt gtt gtt att  att      3271
Arg Ser Ser Leu  Ser Tyr Glu Asp Ala  Asp Cys Val Val Ile  Ile
            1045            1050            1055

gga ggt gca tca  aat gaa gca gga aaa  tgg atg gat gat acc  tgc      3316
Gly Gly Ala Ser  Asn Glu Ala Gly Lys  Trp Met Asp Asp Thr  Cys
            1060            1065            1070
```

175

```
gac agt aaa cga   ggc tac ata tgc cag   aca cga tcc gac cct   tcc        3361
Asp Ser Lys Arg   Gly Tyr Ile Cys Gln   Thr Arg Ser Asp Pro   Ser
        1075               1080                  1085

ttg act aat cct   cca gca acg att caa   aca gat ggc ttt gtt   aaa        3406
Leu Thr Asn Pro   Pro Ala Thr Ile Gln   Thr Asp Gly Phe Val   Lys
        1090               1095                  1100

tat ggc aaa agc   agc tat tca ctc atg   aga caa aaa ttt caa   tgg        3451
Tyr Gly Lys Ser   Ser Tyr Ser Leu Met   Arg Gln Lys Phe Gln   Trp
        1105               1110                  1115

cat gaa gcg gag   aca tac tgc aag ctt   cac aat tcc ctt ata   gcc        3496
His Glu Ala Glu   Thr Tyr Cys Lys Leu   His Asn Ser Leu Ile   Ala
        1120               1125                  1130

agc att ctg gat   ccc tac agt aat gca   ttt gcg tgg ctg cag   atg        3541
Ser Ile Leu Asp   Pro Tyr Ser Asn Ala   Phe Ala Trp Leu Gln   Met
        1135               1140                  1145

gaa aca tct aat   gaa cgt gtg tgg atc   gcc ctg aac agt aac   ttg        3586
Glu Thr Ser Asn   Glu Arg Val Trp Ile   Ala Leu Asn Ser Asn   Leu
        1150               1155                  1160

act gat aat caa   tac act tgg act gat   aag tgg agg gtg agg   tac        3631
Thr Asp Asn Gln   Tyr Thr Trp Thr Asp   Lys Trp Arg Val Arg   Tyr
        1165               1170                  1175

act aac tgg gct   gct gat gag ccc aaa   ttg aaa tca gca tgt   gtt        3676
Thr Asn Trp Ala   Ala Asp Glu Pro Lys   Leu Lys Ser Ala Cys   Val
        1180               1185                  1190

tat ctg gat ctt   gat ggc tac tgg aag   aca gca cat tgc aat   gaa        3721
Tyr Leu Asp Leu   Asp Gly Tyr Trp Lys   Thr Ala His Cys Asn   Glu
        1195               1200                  1205

agt ttt tac ttt   ctc tgt aaa aga tca   gat gaa atc cct gct   act        3766
Ser Phe Tyr Phe   Leu Cys Lys Arg Ser   Asp Glu Ile Pro Ala   Thr
        1210               1215                  1220

gaa ccc cca caa   ctg cct ggc aga tgc   ccg gag tca gat cac   aca        3811
Glu Pro Pro Gln   Leu Pro Gly Arg Cys   Pro Glu Ser Asp His   Thr
        1225               1230                  1235

gca tgg att cct   ttc cat ggt cac tgt   tac tat att gag tcc   tca        3856
Ala Trp Ile Pro   Phe His Gly His Cys   Tyr Tyr Ile Glu Ser   Ser
        1240               1245                  1250

tat aca aga aac   tgg ggc caa gct tct   ctg gaa tgt ctt cga   atg        3901
Tyr Thr Arg Asn   Trp Gly Gln Ala Ser   Leu Glu Cys Leu Arg   Met
        1255               1260                  1265

ggt tcc tct ctg   gtt tcc att gaa agt   gct gca gaa tcc agt   ttt        3946
Gly Ser Ser Leu   Val Ser Ile Glu Ser   Ala Ala Glu Ser Ser   Phe
        1270               1275                  1280
```

176

```
ctg tca tat cgg  gtt gag cca ctt aaa  agt aaa acc aat ttt  tgg      3991
Leu Ser Tyr Arg  Val Glu Pro Leu Lys  Ser Lys Thr Asn Phe  Trp
            1285              1290              1295

ata gga ttg ttc  aga aat gtt gaa ggg  acg tgg ctg tgg ata  aat      4036
Ile Gly Leu Phe  Arg Asn Val Glu Gly  Thr Trp Leu Trp Ile  Asn
            1300              1305              1310

aac agt ccg gtc  tcc ttt gtc aac tgg  aac aca gga gat ccc  tct      4081
Asn Ser Pro Val  Ser Phe Val Asn Trp  Asn Thr Gly Asp Pro  Ser
            1315              1320              1325

ggt gaa cgg aat  gat tgt gta gct tta  cat gcg tct tct ggg  ttt      4126
Gly Glu Arg Asn  Asp Cys Val Ala Leu  His Ala Ser Ser Gly  Phe
            1330              1335              1340

tgg agt aat att  cac tgt tct tcc tac  aaa gga tat att tgt  aaa      4171
Trp Ser Asn Ile  His Cys Ser Ser Tyr  Lys Gly Tyr Ile Cys  Lys
            1345              1350              1355

aga cca aaa att  att gat gct aaa cct  act cat gaa tta ctt  aca      4216
Arg Pro Lys Ile  Ile Asp Ala Lys Pro  Thr His Glu Leu Leu  Thr
            1360              1365              1370

aca aaa gct gac  aca agg aag atg gac  cct tct aaa ccg tct  tcc      4261
Thr Lys Ala Asp  Thr Arg Lys Met Asp  Pro Ser Lys Pro Ser  Ser
            1375              1380              1385

aac gtg gcc gga  gta gtc atc att gtg  atc ctc ctg att tta  acg      4306
Asn Val Ala Gly  Val Val Ile Ile Val  Ile Leu Leu Ile Leu  Thr
            1390              1395              1400

ggt gct ggc ctt  gcc gcc tat ttc ttt  tat aag aaa aga cgt  gtg      4351
Gly Ala Gly Leu  Ala Ala Tyr Phe Phe  Tyr Lys Lys Arg Arg  Val
            1405              1410              1415

cac cta cct caa  gag ggc gcc ttt gaa  aac act ctg tat ttt  aac      4396
His Leu Pro Gln  Glu Gly Ala Phe Glu  Asn Thr Leu Tyr Phe  Asn
            1420              1425              1430

agt cag tca agc  cca gga act agt gat  atg aaa gat ctc gtg  ggc      4441
Ser Gln Ser Ser  Pro Gly Thr Ser Asp  Met Lys Asp Leu Val  Gly
            1435              1440              1445

aat att gaa cag  aat gaa cac tcg gtc  atc tag tacctcaatg            4484
Asn Ile Glu Gln  Asn Glu His Ser Val  Ile
            1450              1455

cgattctgag atatttgaat ttcataaaat tgtaactgaa atttaaaatt tttagttcaa   4544

tgtgattgtt ttctttaaaa tgagtactga attgtactgg tctgtccttt tttcctttgc   4604

ctaattgaag aaataattgc ttgttttcta gcctggcaag atattttcat aaaagaggga   4664

taacaatgct gattactacc ttttaaaata ttttagataa atgcacagca ccacagcacc   4724
```

177

```
acatctaagc attagtgatg ggtagctgat gtcagcttca tgtggatttt aagcactcta    4784

gaaacaatga agcttcttgg catattttaa ggagctccca aaatgtgtta cctattaaat    4844

tgtaactcag caagtagaag accatttgaa aagtcaggta caaatttcct caagtggcat    4904

aaaaatgtag tcagttttct cttttaccag tttttatttc cactccaatt atttagaact    4964

ttatttgtac atgtgcagaa gaataaggca gctgagaatc ttgtttcccc caagagagtt    5024

ttacaggctg agtgttgcaa atgtgttctt tgtcctgtta tatgtatatc aggaatacaa    5084

ggatgtgaaa taaaactgta aatttgcata actggatgta cttagataat gtgaaataaa    5144

cattaaagac aaggtctatt tttaataaaa aaaaaaaaa a    5185
```

<210> 95
<211> 1456
<212> PRT
<213> Homo sapiens

<400> 95

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Met Arg Leu Pro Leu Leu Leu Val Phe Ala Ser Val Ile Pro Gly Ala
1               5                   10                  15


Val Leu Leu Leu Asp Thr Arg Gln Phe Leu Ile Tyr Asn Glu Asp His
            20                  25                  30


Lys Arg Cys Val Asp Ala Val Ser Pro Ser Ala Val Gln Thr Ala Ala
        35                  40                  45


Cys Asn Gln Asp Ala Glu Ser Gln Lys Phe Arg Trp Val Ser Glu Ser
    50                  55                  60


Gln Ile Met Ser Val Ala Phe Lys Leu Cys Leu Gly Val Pro Ser Lys
65                  70                  75                  80


Thr Asp Trp Val Ala Ile Thr Leu Tyr Ala Cys Asp Ser Lys Ser Glu
                85                  90                  95


Phe Gln Lys Trp Glu Cys Lys Asn Asp Thr Leu Leu Gly Ile Lys Gly
            100                 105                 110


Glu Asp Leu Phe Phe Asn Tyr Gly Asn Arg Gln Glu Lys Asn Ile Met
            115                 120                 125
```

178

```
Leu Tyr Lys Gly Ser Gly Leu Trp Ser Arg Trp Lys Ile Tyr Gly Thr
    130             135             140

Thr Asp Asn Leu Cys Ser Arg Gly Tyr Glu Ala Met Tyr Thr Leu Leu
145             150             155             160

Gly Asn Ala Asn Gly Ala Thr Cys Ala Phe Pro Phe Lys Phe Glu Asn
                165             170             175

Lys Trp Tyr Ala Asp Cys Thr Ser Ala Gly Arg Ser Asp Gly Trp Leu
        180             185             190

Trp Cys Gly Thr Thr Thr Asp Tyr Asp Thr Asp Lys Leu Phe Gly Tyr
        195             200             205

Cys Pro Leu Lys Phe Glu Gly Ser Glu Ser Leu Trp Asn Lys Asp Pro
    210             215             220

Leu Thr Ser Val Ser Tyr Gln Ile Asn Ser Lys Ser Ala Leu Thr Trp
225             230             235             240

His Gln Ala Arg Lys Ser Cys Gln Gln Gln Asn Ala Glu Leu Leu Ser
            245             250             255

Ile Thr Glu Ile His Glu Gln Thr Tyr Leu Thr Gly Leu Thr Ser Ser
            260             265             270

Leu Thr Ser Gly Leu Trp Ile Gly Leu Asn Ser Leu Ser Phe Asn Ser
        275             280             285

Gly Trp Gln Trp Ser Asp Arg Ser Pro Phe Arg Tyr Leu Asn Trp Leu
    290             295             300

Pro Gly Ser Pro Ser Ala Glu Pro Gly Lys Ser Cys Val Ser Leu Asn
305             310             315             320

Pro Gly Lys Asn Ala Lys Trp Glu Asn Leu Glu Cys Val Gln Lys Leu
            325             330             335

Gly Tyr Ile Cys Lys Lys Gly Asn Thr Thr Leu Asn Ser Phe Val Ile
            340             345             350
```

179

Pro Ser Glu Ser Asp Val Pro Thr His Cys Pro Ser Gln Trp Trp Pro
        355   360   365

Tyr Ala Gly His Cys Tyr Lys Ile His Arg Asp Glu Lys Lys Ile Gln
        370   375   380

Arg Asp Ala Leu Thr Thr Cys Arg Lys Glu Gly Gly Asp Leu Thr Ser
385   390   395   400

Ile His Thr Ile Glu Glu Leu Asp Phe Ile Ile Ser Gln Leu Gly Tyr
                405   410   415

Glu Pro Asn Asp Glu Leu Trp Ile Gly Leu Asn Asp Ile Lys Ile Gln
            420   425   430

Met Tyr Phe Glu Trp Ser Asp Gly Thr Pro Val Thr Phe Thr Lys Trp
        435   440   445

Leu Arg Gly Glu Pro Ser His Glu Asn Asn Arg Gln Glu Asp Cys Val
        450   455   460

Val Met Lys Gly Lys Asp Gly Tyr Trp Ala Asp Arg Gly Cys Glu Trp
465   470   475   480

Pro Leu Gly Tyr Ile Cys Lys Met Lys Ser Arg Ser Gln Gly Pro Glu
                485   490   495

Ile Val Glu Val Glu Lys Gly Cys Arg Lys Gly Trp Lys Lys His His
            500   505   510

Phe Tyr Cys Tyr Met Ile Gly His Thr Leu Ser Thr Phe Ala Glu Ala
        515   520   525

Asn Gln Thr Cys Asn Asn Glu Asn Ala Tyr Leu Thr Thr Ile Glu Asp
        530   535   540

Arg Tyr Glu Gln Ala Phe Leu Thr Ser Phe Val Gly Leu Arg Pro Glu
545   550   555   560

Lys Tyr Phe Trp Thr Gly Leu Ser Asp Ile Gln Thr Lys Gly Thr Phe
                565   570   575

180

Gln Trp Thr Ile Glu Glu Glu Val Arg Phe Thr His Trp Asn Ser Asp
            580   585   590

Met Pro Gly Arg Lys Pro Gly Cys Val Ala Met Arg Thr Gly Ile Ala
            595   600   605

Gly Gly Leu Trp Asp Val Leu Lys Cys Asp Glu Lys Ala Lys Phe Val
    610   615   620

Cys Lys His Trp Ala Glu Gly Val Thr His Pro Pro Lys Pro Thr Thr
625   630   635   640

Thr Pro Glu Pro Lys Cys Pro Glu Asp Trp Gly Ala Ser Ser Arg Thr
                645   650   655

Ser Leu Cys Phe Lys Leu Tyr Ala Lys Gly Lys His Glu Lys Lys Thr
            660   665   670

Trp Phe Glu Ser Arg Asp Phe Cys Arg Ala Leu Gly Gly Asp Leu Ala
        675   680   685

Ser Ile Asn Asn Lys Glu Glu Gln Gln Thr Ile Trp Arg Leu Ile Thr
    690   695   700

Ala Ser Gly Ser Tyr His Lys Leu Phe Trp Leu Gly Leu Thr Tyr Gly
705   710   715   720

Ser Pro Ser Glu Gly Phe Thr Trp Ser Asp Gly Ser Pro Val Ser Tyr
                725   730   735

Glu Asn Trp Ala Tyr Gly Glu Pro Asn Asn Tyr Gln Asn Val Glu Tyr
            740   745   750

Cys Gly Glu Leu Lys Gly Asp Pro Thr Met Ser Trp Asn Asp Ile Asn
        755   760   765

Cys Glu His Leu Asn Asn Trp Ile Cys Gln Ile Gln Lys Gly Gln Thr
    770   775   780

Pro Lys Pro Glu Pro Thr Pro Ala Pro Gln Asp Asn Pro Pro Val Thr
785   790   795   800

181

Glu Asp Gly Trp Val Ile Tyr Lys Asp Tyr Gln Tyr Tyr Phe Ser Lys
              805   810   815

Glu Lys Glu Thr Met Asp Asn Ala Arg Ala Phe Cys Lys Arg Asn Phe
              820   825   830

Gly Asp Leu Val Ser Ile Gln Ser Glu Ser Glu Lys Lys Phe Leu Trp
              835   840   845

Lys Tyr Val Asn Arg Asn Asp Ala Gln Ser Ala Tyr Phe Ile Gly Leu
              850   855   860

Leu Ile Ser Leu Asp Lys Lys Phe Ala Trp Met Asp Gly Ser Lys Val
865   870   875   880

Asp Tyr Val Ser Trp Ala Thr Gly Glu Pro Asn Phe Ala Asn Glu Asp
              885   890   895

Glu Asn Cys Val Thr Met Tyr Ser Asn Ser Gly Phe Trp Asn Asp Ile
              900   905   910

Asn Cys Gly Tyr Pro Asn Ala Phe Ile Cys Gln Arg His Asn Ser Ser
              915   920   925

Ile Asn Ala Thr Thr Val Met Pro Thr Met Pro Ser Val Pro Ser Gly
              930   935   940

Cys Lys Glu Gly Trp Asn Phe Tyr Ser Asn Lys Cys Phe Lys Ile Phe
945   950   955   960

Gly Phe Met Glu Glu Glu Arg Lys Asn Trp Gln Glu Ala Arg Lys Ala
              965   970   975

Cys Ile Gly Phe Gly Gly Asn Leu Val Ser Ile Gln Asn Glu Lys Glu
              980   985   990

Gln Ala Phe Leu Thr Tyr His Met Lys Asp Ser Thr Phe Ser Ala Trp
              995   1000   1005

Thr Gly Leu Asn Asp Val Asn Ser Glu His Thr Phe Leu Trp Thr
              1010   1015   1020

182

```
Asp Gly  Arg Gly Val His Tyr  Thr Asn Trp Gly Lys  Gly Tyr Pro
    1025              1030              1035
```

```
Gly Gly  Arg Arg Ser Ser Leu  Ser Tyr Glu Asp Ala  Asp Cys Val
    1040              1045              1050
```

```
Val Ile  Ile Gly Gly Ala Ser  Asn Glu Ala Gly Lys  Trp Met Asp
    1055              1060              1065
```

```
Asp Thr  Cys Asp Ser Lys Arg  Gly Tyr Ile Cys Gln  Thr Arg Ser
    1070              1075              1080
```

```
Asp Pro  Ser Leu Thr Asn Pro  Pro Ala Thr Ile Gln  Thr Asp Gly
    1085              1090              1095
```

```
Phe Val  Lys Tyr Gly Lys Ser  Ser Tyr Ser Leu Met  Arg Gln Lys
    1100              1105              1110
```

```
Phe Gln  Trp His Glu Ala Glu  Thr Tyr Cys Lys Leu  His Asn Ser
    1115              1120              1125
```

```
Leu Ile  Ala Ser Ile Leu Asp  Pro Tyr Ser Asn Ala  Phe Ala Trp
    1130              1135              1140
```

```
Leu Gln  Met Glu Thr Ser Asn  Glu Arg Val Trp Ile  Ala Leu Asn
    1145              1150              1155
```

```
Ser Asn  Leu Thr Asp Asn Gln  Tyr Thr Trp Thr Asp  Lys Trp Arg
    1160              1165              1170
```

```
Val Arg  Tyr Thr Asn Trp Ala  Ala Asp Glu Pro Lys  Leu Lys Ser
    1175              1180              1185
```

```
Ala Cys  Val Tyr Leu Asp Leu  Asp Gly Tyr Trp Lys  Thr Ala His
    1190              1195              1200
```

```
Cys Asn  Glu Ser Phe Tyr Phe  Leu Cys Lys Arg Ser  Asp Glu Ile
    1205              1210              1215
```

```
Pro Ala  Thr Glu Pro Pro Gln  Leu Pro Gly Arg Cys  Pro Glu Ser
    1220              1225              1230
```

183

```
Asp His Thr Ala Trp Ile Pro  Phe His Gly His Cys  Tyr Tyr Ile
    1235          1240              1245

Glu Ser Ser Tyr Thr Arg Asn  Trp Gly Gln Ala Ser  Leu Glu Cys
    1250          1255              1260

Leu Arg Met Gly Ser Ser Leu  Val Ser Ile Glu Ser  Ala Ala Glu
    1265          1270              1275

Ser Ser Phe Leu Ser Tyr Arg  Val Glu Pro Leu Lys  Ser Lys Thr
    1280          1285              1290

Asn Phe Trp Ile Gly Leu Phe  Arg Asn Val Glu Gly  Thr Trp Leu
    1295          1300              1305

Trp Ile Asn Asn Ser Pro Val  Ser Phe Val Asn Trp  Asn Thr Gly
    1310          1315              1320

Asp Pro Ser Gly Glu Arg Asn  Asp Cys Val Ala Leu  His Ala Ser
    1325          1330              1335

Ser Gly Phe Trp Ser Asn Ile  His Cys Ser Ser Tyr  Lys Gly Tyr
    1340          1345              1350

Ile Cys Lys Arg Pro Lys Ile  Ile Asp Ala Lys Pro  Thr His Glu
    1355          1360              1365

Leu Leu Thr Thr Lys Ala Asp  Thr Arg Lys Met Asp  Pro Ser Lys
    1370          1375              1380

Pro Ser Ser Asn Val Ala Gly  Val Val Ile Ile Val  Ile Leu Leu
    1385          1390              1395

Ile Leu Thr Gly Ala Gly Leu  Ala Ala Tyr Phe Phe  Tyr Lys Lys
    1400          1405              1410

Arg Arg Val His Leu Pro Gln  Glu Gly Ala Phe Glu  Asn Thr Leu
    1415          1420              1425

Tyr Phe Asn Ser Gln Ser Ser  Pro Gly Thr Ser Asp  Met Lys Asp
    1430          1435              1440
```

184

Leu Val Gly Asn Ile Glu Gln Asn Glu His Ser Val Ile
    1445   1450   1455

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<211> 780
<212> DNA
<213> Homo sapiens

<400> 96
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acaaaaaatg gcatcacctg tcaaaaatgg agttccactt ctccccacag acctagattc   120

tcacctgcta cacacccctc agagggactg gaggagaact actgcaggaa tccagacaac   180

gatccgcagg ggccctggtg ctatactact gatccagaaa agagatatga ctactgcgac   240

attcttgagt gtgaagagga atgtatgcat tgcagtggag aaaactatga cggcaaaatt   300

tccaagacca tgtctggact ggaatgccag gcctgggact ctcagagccc acacgctcat   360

ggatacattc cttccaaatt tccaaacaag aacctgaaga agaattactg tcgtaacccc   420

gatagggagc tgcggccttg gtgtttcacc accgacccca caagcgctg ggaactttgt   480

gacatccccc gctgcacaac acctccacca tcttctggtc ccacctacca gtgtctgaag   540

ggaacaggtg aaaactatcg cgggaatgtg gctgttaccg tgtccgggca cacctgtcag   600

cactggagtg cacagacccc tcacacacat gaaaggacac agaaaacttt ccccctgcaaa   660

aatttggatg aaaactactg ccgcaatcct gacggaaaaa gggccccatg gtgccataca   720

accaacagcc aagtgcggtg ggagtactgt aagataccgt cctgtgactc ctccccagta   780

<210> 97
<211> 1449
<212> DNA
<213> Homo sapiens

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<221> CDS
<222> (1)..(1449)
<223>

<400> 97
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Met Ala Ser Phe Ser Ala Glu Thr Asn Ser Thr Asp Leu Leu Ser Gln
1   5   10   15

cca tgg aat gag ccc cca gta att ctc tcc atg gtc att ctc agc ctt   96
Pro Trp Asn Glu Pro Pro Val Ile Leu Ser Met Val Ile Leu Ser Leu
            20   25   30

185

```
act ttt tta ctg gga ttg cca ggc aat ggg ctg gtg ctg tgg gtg gct        144
Thr Phe Leu Leu Gly Leu Pro Gly Asn Gly Leu Val Leu Trp Val Ala
        35              40              45

ggc ctg aag atg cag cgg aca gtg aac aca att tgg ttc ctc cac ctc        192
Gly Leu Lys Met Gln Arg Thr Val Asn Thr Ile Trp Phe Leu His Leu
    50              55              60

acc ttg gcg gac ctc ctc tgc tgc ctc tcc ttg ccc ttc tcg ctg gct        240
Thr Leu Ala Asp Leu Leu Cys Cys Leu Ser Leu Pro Phe Ser Leu Ala
65              70              75              80

cac ttg gct ctc cag gga cag tgg ccc tac ggc agg ttc cta tgc aag        288
His Leu Ala Leu Gln Gly Gln Trp Pro Tyr Gly Arg Phe Leu Cys Lys
            85              90              95

ctc atc ccc tcc atc att gtc ctc aac atg ttt gcc agt gtc ttc ctg        336
Leu Ile Pro Ser Ile Ile Val Leu Asn Met Phe Ala Ser Val Phe Leu
            100             105             110

ctt act gcc att agc ctg gat cgc tgt ctt gtg gta ttc aag cca atc        384
Leu Thr Ala Ile Ser Leu Asp Arg Cys Leu Val Val Phe Lys Pro Ile
        115             120             125

tgg tgt cag aat cat cgc aat gta ggg atg gcc tgc tct atc tgt gga        432
Trp Cys Gln Asn His Arg Asn Val Gly Met Ala Cys Ser Ile Cys Gly
    130             135             140

tgt atc tgg gtg gtg gct ttt gtg atg tgc att cct gtg ttc gtg tac        480
Cys Ile Trp Val Val Ala Phe Val Met Cys Ile Pro Val Phe Val Tyr
145             150             155             160

cgg gaa atc ttc act aca gac aac cat aat aga tgt ggc tac aaa ttt        528
Arg Glu Ile Phe Thr Thr Asp Asn His Asn Arg Cys Gly Tyr Lys Phe
            165             170             175

ggt ctc tcc agc tca tta gat tat cca gac ttt tat gga gat cca cta        576
Gly Leu Ser Ser Ser Leu Asp Tyr Pro Asp Phe Tyr Gly Asp Pro Leu
        180             185             190

gaa aac agg tct ctt gaa aac att gtt cag ccg cct gga gaa atg aat        624
Glu Asn Arg Ser Leu Glu Asn Ile Val Gln Pro Pro Gly Glu Met Asn
        195             200             205

gat agg tta gat cct tcc tct ttc caa aca aat gat cat cct tgg aca        672
Asp Arg Leu Asp Pro Ser Ser Phe Gln Thr Asn Asp His Pro Trp Thr
    210             215             220

gtc ccc act gtc ttc caa cct caa aca ttt caa aga cct tct gca gat        720
Val Pro Thr Val Phe Gln Pro Gln Thr Phe Gln Arg Pro Ser Ala Asp
225             230             235             240

tca ctc cct agg ggt tct gct agg tta aca agt caa aat ctg tat tct        768
Ser Leu Pro Arg Gly Ser Ala Arg Leu Thr Ser Gln Asn Leu Tyr Ser
            245             250             255
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186

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aat gta ttt aaa cct gct gat gtg gtc tca cct aaa atc ccc agt ggg        816
Asn Val Phe Lys Pro Ala Asp Val Val Ser Pro Lys Ile Pro Ser Gly
        260             265             270

ttt cct att gaa gat cac gaa acc agc cca ctg gat aac tct gat gct        864
Phe Pro Ile Glu Asp His Glu Thr Ser Pro Leu Asp Asn Ser Asp Ala
        275             280             285

ttt ctc tct act cat tta aag ctg ttc cct agc gct tct agc aat tcc        912
Phe Leu Ser Thr His Leu Lys Leu Phe Pro Ser Ala Ser Ser Asn Ser
        290             295             300

ttc tac gag tct gag cta cca caa ggt ttc cag gat tat tac aat tta        960
Phe Tyr Glu Ser Glu Leu Pro Gln Gly Phe Gln Asp Tyr Tyr Asn Leu
305             310             315             320

ggc caa ttc aca gat gac gat caa gtg cca aca ccc ctc gtg gca ata       1008
Gly Gln Phe Thr Asp Asp Asp Gln Val Pro Thr Pro Leu Val Ala Ile
            325             330             335

acg atc act agg cta gtg gtg ggt ttc ctg ctg ccc tct gtt atc atg       1056
Thr Ile Thr Arg Leu Val Val Gly Phe Leu Leu Pro Ser Val Ile Met
            340             345             350

ata gcc tgt tac agc ttc att gtc ttc cga atg caa agg ggc cgc ttc       1104
Ile Ala Cys Tyr Ser Phe Ile Val Phe Arg Met Gln Arg Gly Arg Phe
            355             360             365

gcc aag tct cag agc aaa acc ttt cga gtg gcc gtg gtg gtg gtg gct       1152
Ala Lys Ser Gln Ser Lys Thr Phe Arg Val Ala Val Val Val Val Ala
        370             375             380

gtc ttt ctt gtc tgc tgg act cca tac cac att ttt gga gtc ctg tca       1200
Val Phe Leu Val Cys Trp Thr Pro Tyr His Ile Phe Gly Val Leu Ser
385             390             395             400

ttg ctt act gac cca gaa act ccc ttg ggg aaa act ctg atg tcc tgg       1248
Leu Leu Thr Asp Pro Glu Thr Pro Leu Gly Lys Thr Leu Met Ser Trp
            405             410             415

gat cat gta tgc att gct cta gca tct gcc aat agt tgc ttt aat ccc       1296
Asp His Val Cys Ile Ala Leu Ala Ser Ala Asn Ser Cys Phe Asn Pro
            420             425             430

ttc ctt tat gcc ctc ttg ggg aaa gat ttt agg aag aaa gca agg cag       1344
Phe Leu Tyr Ala Leu Leu Gly Lys Asp Phe Arg Lys Lys Ala Arg Gln
        435             440             445

tcc att cag gga att ctg gag gca gcc ttc agt gag gag ctc aca cgt       1392
Ser Ile Gln Gly Ile Leu Glu Ala Ala Phe Ser Glu Glu Leu Thr Arg
        450             455             460

tcc acc cac tgt ccc tca aac aat gtc att tca gaa aga aat agt aca       1440
Ser Thr His Cys Pro Ser Asn Asn Val Ile Ser Glu Arg Asn Ser Thr
465             470             475             480
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187

act gtg tga   1449
Thr Val

<210> 98
<211> 482
<212> PRT
<213> Homo sapiens

<400> 98

Met Ala Ser Phe Ser Ala Glu Thr Asn Ser Thr Asp Leu Leu Ser Gln
1   5   10   15

Pro Trp Asn Glu Pro Pro Val Ile Leu Ser Met Val Ile Leu Ser Leu
            20   25   30

Thr Phe Leu Leu Gly Leu Pro Gly Asn Gly Leu Val Leu Trp Val Ala
        35   40   45

Gly Leu Lys Met Gln Arg Thr Val Asn Thr Ile Trp Phe Leu His Leu
    50   55   60

Thr Leu Ala Asp Leu Leu Cys Cys Leu Ser Leu Pro Phe Ser Leu Ala
65   70   75   80

His Leu Ala Leu Gln Gly Gln Trp Pro Tyr Gly Arg Phe Leu Cys Lys
                85   90   95

Leu Ile Pro Ser Ile Ile Val Leu Asn Met Phe Ala Ser Val Phe Leu
            100   105   110

Leu Thr Ala Ile Ser Leu Asp Arg Cys Leu Val Val Phe Lys Pro Ile
        115   120   125

Trp Cys Gln Asn His Arg Asn Val Gly Met Ala Cys Ser Ile Cys Gly
    130   135   140

Cys Ile Trp Val Val Ala Phe Val Met Cys Ile Pro Val Phe Val Tyr
145   150   155   160

Arg Glu Ile Phe Thr Thr Asp Asn His Asn Arg Cys Gly Tyr Lys Phe
                165   170   175

188

```
Gly Leu Ser Ser Ser Leu Asp Tyr Pro Asp Phe Tyr Gly Asp Pro Leu
            180              185              190

Glu Asn Arg Ser Leu Glu Asn Ile Val Gln Pro Pro Gly Glu Met Asn
            195              200              205

Asp Arg Leu Asp Pro Ser Ser Phe Gln Thr Asn Asp His Pro Trp Thr
    210              215              220

Val Pro Thr Val Phe Gln Pro Gln Thr Phe Gln Arg Pro Ser Ala Asp
225              230              235              240

Ser Leu Pro Arg Gly Ser Ala Arg Leu Thr Ser Gln Asn Leu Tyr Ser
            245              250              255

Asn Val Phe Lys Pro Ala Asp Val Val Ser Pro Lys Ile Pro Ser Gly
            260              265              270

Phe Pro Ile Glu Asp His Glu Thr Ser Pro Leu Asp Asn Ser Asp Ala
            275              280              285

Phe Leu Ser Thr His Leu Lys Leu Phe Pro Ser Ala Ser Ser Asn Ser
    290              295              300

Phe Tyr Glu Ser Glu Leu Pro Gln Gly Phe Gln Asp Tyr Tyr Asn Leu
305              310              315              320

Gly Gln Phe Thr Asp Asp Asp Gln Val Pro Thr Pro Leu Val Ala Ile
            325              330              335

Thr Ile Thr Arg Leu Val Val Gly Phe Leu Leu Pro Ser Val Ile Met
            340              345              350

Ile Ala Cys Tyr Ser Phe Ile Val Phe Arg Met Gln Arg Gly Arg Phe
            355              360              365

Ala Lys Ser Gln Ser Lys Thr Phe Arg Val Ala Val Val Val Val Ala
            370              375              380

Val Phe Leu Val Cys Trp Thr Pro Tyr His Ile Phe Gly Val Leu Ser
385              390              395              400
```

189

```
Leu Leu Thr Asp Pro Glu Thr Pro Leu Gly Lys Thr Leu Met Ser Trp
            405                 410                 415

Asp His Val Cys Ile Ala Leu Ala Ser Ala Asn Ser Cys Phe Asn Pro
            420                 425                 430

Phe Leu Tyr Ala Leu Leu Gly Lys Asp Phe Arg Lys Lys Ala Arg Gln
            435                 440                 445

Ser Ile Gln Gly Ile Leu Glu Ala Ala Phe Ser Glu Glu Leu Thr Arg
        450                 455                 460

Ser Thr His Cys Pro Ser Asn Asn Val Ile Ser Glu Arg Asn Ser Thr
465                 470                 475                 480

Thr Val
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<210>   99
<211>   852
<212>   DNA
<213>   Homo sapiens

<220>
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<222>   (59)..(463)
<223>

<400>   99
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atg gct cag tca ctg gct ctg agc ctc ctt atc ctg gtt ctg gcc ttt     106
Met Ala Gln Ser Leu Ala Leu Ser Leu Leu Ile Leu Val Leu Ala Phe
1                5                  10                  15

ggc atc ccc agg acc caa ggc agt gat gga ggg gct cag gac tgt tgc     154
Gly Ile Pro Arg Thr Gln Gly Ser Asp Gly Gly Ala Gln Asp Cys Cys
                20                  25                  30

ctc aag tac agc caa agg aag att ccc gcc aag gtt gtc cgc agc tac     202
Leu Lys Tyr Ser Gln Arg Lys Ile Pro Ala Lys Val Val Arg Ser Tyr
            35                  40                  45

cgg aag cag gaa cca agc tta ggc tgc tcc atc cca gct atc ctg ttc     250
Arg Lys Gln Glu Pro Ser Leu Gly Cys Ser Ile Pro Ala Ile Leu Phe
        50                  55                  60
```

190

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ttg ccc cgc aag cgc tct cag gca gag cta tgt gca gac cca aag gag    298
Leu Pro Arg Lys Arg Ser Gln Ala Glu Leu Cys Ala Asp Pro Lys Glu
65              70              75              80

ctc tgg gtg cag cag ctg atg cag cat ctg gac aag aca cca tcc cca    346
Leu Trp Val Gln Gln Leu Met Gln His Leu Asp Lys Thr Pro Ser Pro
                85              90              95

cag aaa cca gcc cag ggc tgc agg aag gac agg ggg gcc tcc aag act    394
Gln Lys Pro Ala Gln Gly Cys Arg Lys Asp Arg Gly Ala Ser Lys Thr
            100             105             110

ggc aag aaa gga aag ggc tcc aaa ggc tgc aag agg act gag cgg tca    442
Gly Lys Lys Gly Lys Gly Ser Lys Gly Cys Lys Arg Thr Glu Arg Ser
            115             120             125

cag acc cct aaa ggg cca tag cccagtgagc agcctggagc cctggagacc      493
Gln Thr Pro Lys Gly Pro
        130

ccaccagcct caccaacgct tgaagcctga acccaagatg caagaaggag gctatgctca   553

ggggccctgg agcagccacc ccatgctggc cttgccacac tctttctcct gctttaacca   613

ccccatctgc attcccagct ctaccctgca tggctgagct gcccacagca ggccaggtcc   673

agagagaccg aggagggaga gtctcccagg gagcatgaga ggaggcagca ggactgtccc   733

cttgaaggag aatcatcagg accctggacc tgatacggct ccccagtaca ccccacctct   793

tccttgtaaa tatgatttat acctaactga ataaaaagct gttctgtctt cccacccgc    852


<210>    100
<211>    134
<212>    PRT
<213>    Homo sapiens

<400>    100

Met Ala Gln Ser Leu Ala Leu Ser Leu Leu Ile Leu Val Leu Ala Phe
1               5               10              15


Gly Ile Pro Arg Thr Gln Gly Ser Asp Gly Gly Ala Gln Asp Cys Cys
            20              25              30


Leu Lys Tyr Ser Gln Arg Lys Ile Pro Ala Lys Val Val Arg Ser Tyr
            35              40              45


Arg Lys Gln Glu Pro Ser Leu Gly Cys Ser Ile Pro Ala Ile Leu Phe
        50              55              60
```

191

```
Leu Pro Arg Lys Arg Ser Gln Ala Glu Leu Cys Ala Asp Pro Lys Glu
65              70          75              80

Leu Trp Val Gln Gln Leu Met Gln His Leu Asp Lys Thr Pro Ser Pro
                85              90              95

Gln Lys Pro Ala Gln Gly Cys Arg Lys Asp Arg Gly Ala Ser Lys Thr
            100             105             110

Gly Lys Lys Gly Lys Gly Ser Lys Gly Cys Lys Arg Thr Glu Arg Ser
        115             120             125

Gln Thr Pro Lys Gly Pro
    130
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<212> DNA
<213> Homo sapiens

<400> 101
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acagtcatct gtctggacgc gctgggtgga tgcggggggc tcctgggaac tgtgttggag   180

ccgagcaagc gctagccagg cgcaagcgcg cacagactgt agccatccga ggacacccc    240

gccccccgg cccacccgga gacacccgcg cagaatcgcc tccggatccc ctgcagtcgg    300

cgggaggtaa ggagcagggc ttgcaaaccg cccggcgccc agggaagcga cgagcgccgg   360

ggcaaggcaa gccctggacg ggattgcgac gtgcgcaccg ggcgccctaa tatgcccggg   420

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gccccgaagg catcctggct agaggagacc cgccctaatc cttttgcagc ccttaccggg   540

gggagtaatg gcttctgcga aaagaaattc cctcggctct agaagatctg tctgtgtttg   600

agctgtcgga gagccggtgc gtccccaccc caggctgggg ttcttctcca aagggtgccc   660

ctggaggaag aagagggggg gattaggcag ggcgaggccg ccgcggtcgc aatctgggtc   720

acggctgctc cagcttggag gagaggcggc tctcccggcg acctcctcgc gcgcggcgcc   780

cctgccattc ccgggaacag gggctcagcc tctccctccc tggaagagga cgttgtcgtg   840

gtttggaaga gcaggggtgg gcttagagct tccaattaag ctattggcag gagtatccct   900
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192

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gcagcgggtg aatgccgagg ggcgtttgcc caaatttggg gaggggaagg atttgtggat   960

atgggtgtct gttgttggtc tctgtctaga gaaaggcttt tttttatttg caaagttttc   1020

taaatcccct gctatcattt gcactcctga ggttgcattt ttacaaaggg ggtagaaggt   1080

actccaaata ccattcccgg tagctgggtc ggagagcctg gggcttcccc tgagcagccg   1140

gccccacacc gctgcgagtg cggttgtctg cgtgctcgtg agagctagaa ttctgcagcc   1200

aggaacagcc ccctcccccca ggcagtgcct tgtgtgaatg aaatggcagt ttccaaagtt   1260

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gcgcccattg cctatcccct cggtctgccc cgtttgccca ccctctccgg tgtgtctgtc   1500

ggttgcagtg ttggaggtcg gcgccggccc ccgccttccg cgcccccac gggaaggaag   1560

cacccccggt attaaaacga acggggcgga aagaagccct cagtcgccgg ccgggaggcg   1620

agccgatgcc gagctgctcc acgtccacca tgccgggcat gatctgcaag aacccagacc   1680

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cggagatgct gcttgagaac gagctgtggg gcagcccggc cgaggaggac gcgttcggcc   1920

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gcttctccgc ccgcgagaag ctggagcgcg ccgtgagcga gaagctgcag cacggccgcg   2040

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gtcgcgggca cggcggggct gcgggagccg ccgcgccgg ggccgccctg ccgccgagc   2160

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cccgggtcgc gtccccttttg ttagtgctcg tatgtcttgg cctggggagc attttggagg   2520

cagtgctagg ggcagagagg tcctgtttcc cccaagtctc tcctcggggt aaagagaagg   2580
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193

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ggctgagaga atgccgttgc aaaagggtg ctctccaatt ctcgccttca ctaaagttcc    2640

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cctctctttt gcaggcagtc tgaggaataa aattggagaa gttggtggct aaaccgggtg    2760

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acccccttg gactttgaaa acagtgtttt cagaatgcag gtggataaca agcctaaatt    3540

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gctaaatgag gctcctaaaa tgagaggcct caactcttta agtgtggagc tagaaatgta    4200

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194

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gacacatccg cctttttgtat acatcctggg taatgagagg tggctttttgc ggccagtatt    6120

agactggaag ttcataccta agtactgtaa taatacctca atgtttgagg agcatgtttt    6180

gtatacaaat atattgttaa tctctgttat gtactgtact aattcttaca ctgcctgtat    6240

actttagtat gacgctgata cataactaaa tttgatactt atattttcgt atgaaaatga    6300

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tttttgcacc tgtacaatcc tggttggggg gcatgagtca tgtccccact taaggtggag    6720

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aagtagatgt agtcgtttta cctgaaatgt ggaataatgg ctatgattta gagcatttaa    180

atgaaaaagc agataataat ctaggacaaa gttttttcatt tattaaacat ttagctgaaa    240
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196

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tagttcctat gttaagagag catgaatttt taaccgctgg cgaatacgta gctgaaccct   420

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cgatagttat aaacccaaat ggagatttag ttggagaatt aaatgaatcc gcagatattt   720

tgactgtaga tttaaactta aatgaagtag aacagcaacg cgaaaatata cctgtattta   780

aaagtattaa attagatttg tataaataag aagcgcccga aataatattt aacacatgtc   840

atgactaaac atagatttat gagagatttt tcataagtct atgtttattt ttttataata   900

gataactcag taagaaccca tttcgccctt tgcaaatgaa tgattttctt aattaaattg   960

attaattttt tgaccttttc caacattaga cttattcata tattttaacg gcgggtctca  1020

taatgatgat taactcatcc cttcttcatt acaaaaaagg ccgcgagctt gggaggggct  1080

cacgaccata cttattatta agggaatgtt ttacagttat tttttcaatc tatttttggg  1140

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caatgaaagt aattaattat tcatcttatt ttttagtgaa tttgttcact gtgtcgataa  1440

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ccttaattaa gataaaaatt cttaaaatta aacaactcat caactatttt ccatcacatc  1560

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accagtttgc cacgtatctt caaaagagaa ataacttaga tcatattcaa tttttgcaag  1860

tacgattagg gatgcaggtc ttagctaaaa atataggtaa attaattgtt atgtatacta  1920
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197

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ttgcctatat tttaaacatt tttctgttta cgttaattac gaatttaaca ttttatttaa      1980

taagaagaca tgcacatggt gcacatgcac cttcttcttt ttggtgttat gtagaaagta      2040

ttatactatt tatacttta cctttagtaa tagtaaattt tcatattaac tttttaatta      2100

tgattatttt aacagttatt tctttaggtg taatctcagt atatgctcct gcagcaacta      2160

aaaagaagcc cattcctgtg cgacttatta aacgaaaaaa atattatgcg attattgtta      2220

gtttaaccct tttcattatc acacttatca tcaaagagcc atttgcccaa ttcattcaat      2280

taggcatcat aatagaagct attacattat tacctatttt ctttattaag gaggacttaa      2340

aatgaataca ttatttaact tattttttga ttttattact gggattttaa aaaacattgg      2400

taacatcgca gcttatagta cttgtgactt cataatggat gaagttgaag taccaaaaga      2460

attaacacaa ttacgcaat aatttaaata gagagtgtga tagtag gtg gaa tta         2515
                                                     Val Glu Leu
                                                      1


tta aat agt tat aat ttt gtt tta ttc gta tta act caa atg ata tta      2563
Leu Asn Ser Tyr Asn Phe Val Leu Phe Val Leu Thr Gln Met Ile Leu
        5                      10                  15

atg ttt aca ata cca gct ata att agt ggt att aag tac agt aaa ctt      2611
Met Phe Thr Ile Pro Ala Ile Ile Ser Gly Ile Lys Tyr Ser Lys Leu
 20                  25                  30                  35

gat tat ttt ttc atc ata gta att tcg aca tta tcg tta ttt cta ttt      2659
Asp Tyr Phe Phe Ile Ile Val Ile Ser Thr Leu Ser Leu Phe Leu Phe
                40                  45                  50

aaa atg ttt gat agc gcg tcc tta atc ata tta act tca ttt att att      2707
Lys Met Phe Asp Ser Ala Ser Leu Ile Ile Leu Thr Ser Phe Ile Ile
                55                  60                  65

ata atg tat ttt gtc aaa atc aaa tgg tat tct att ttg ttg att atg      2755
Ile Met Tyr Phe Val Lys Ile Lys Trp Tyr Ser Ile Leu Leu Ile Met
            70                  75                  80

act tcg cag att att cta tac tgt gct aac tac atg tat ata gtt ata      2803
Thr Ser Gln Ile Ile Leu Tyr Cys Ala Asn Tyr Met Tyr Ile Val Ile
        85                  90                  95

tat gca tat atc acc aaa att tct gat agt ata ttt gta ata ttc cct      2851
Tyr Ala Tyr Ile Thr Lys Ile Ser Asp Ser Ile Phe Val Ile Phe Pro
100                 105                 110                 115

agc ttt ttt gta gtt tat gtg act att agt ata cta ttc tca tat ata      2899
Ser Phe Phe Val Val Tyr Val Thr Ile Ser Ile Leu Phe Ser Tyr Ile
                120                 125                 130
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198

```
ata aat aga gtt ctc aaa aaa att agc aca cca tat cta ata cta aac       2947
Ile Asn Arg Val Leu Lys Lys Ile Ser Thr Pro Tyr Leu Ile Leu Asn
            135                     140                 145

aaa gga ttt tta ata gtt att tcg act atc tta ctg ctt act ttt tca       2995
Lys Gly Phe Leu Ile Val Ile Ser Thr Ile Leu Leu Leu Thr Phe Ser
            150                     155                 160

tta ttt ttc ttt tat tca caa ata aac tcg gat gaa gct aaa gta ata       3043
Leu Phe Phe Phe Tyr Ser Gln Ile Asn Ser Asp Glu Ala Lys Val Ile
            165                     170                 175

agg cag tat tct tta ttt tat tgg tat cac tat att tta agt ata tta       3091
Arg Gln Tyr Ser Leu Phe Tyr Trp Tyr His Tyr Ile Leu Ser Ile Leu
180                     185                 190                 195

aca ttg tat tct caa ttt ctc ctt aaa gag atg aaa tat aaa cgt aat       3139
Thr Leu Tyr Ser Gln Phe Leu Leu Lys Glu Met Lys Tyr Lys Arg Asn
            200                     205                 210

caa gaa gaa att gaa acc tat tat gaa tat aca ttg aag att gaa gct       3187
Gln Glu Glu Ile Glu Thr Tyr Tyr Glu Tyr Thr Leu Lys Ile Glu Ala
            215                     220                 225

atc aac aac gaa atg cgc aag ttc cgt cat gat tat gtc aat atc tta       3235
Ile Asn Asn Glu Met Arg Lys Phe Arg His Asp Tyr Val Asn Ile Leu
            230                     235                 240

acg aca ctt tca gaa tac att cga gaa gat gac atg cct ggc cta cgt       3283
Thr Thr Leu Ser Glu Tyr Ile Arg Glu Asp Asp Met Pro Gly Leu Arg
            245                     250                 255

gat tat ttc aat aaa aat att gta cct atg aaa gac aat tta caa atg       3331
Asp Tyr Phe Asn Lys Asn Ile Val Pro Met Lys Asp Asn Leu Gln Met
260                     265                 270                 275

aat gct ata aaa tta aat ggt atc gag aat ctt aaa gta cgt gaa att       3379
Asn Ala Ile Lys Leu Asn Gly Ile Glu Asn Leu Lys Val Arg Glu Ile
            280                     285                 290

aaa ggc tta att act gcg aaa att tta cgt gca caa gaa atg aat att       3427
Lys Gly Leu Ile Thr Ala Lys Ile Leu Arg Ala Gln Glu Met Asn Ile
            295                     300                 305

ccg att agt atc gaa ata ccc gat gaa gta agt agc att aac ttg aat       3475
Pro Ile Ser Ile Glu Ile Pro Asp Glu Val Ser Ser Ile Asn Leu Asn
            310                     315                 320

atg atc gat tta agt cgc agt att ggt att att ctt gat aat gca att       3523
Met Ile Asp Leu Ser Arg Ser Ile Gly Ile Ile Leu Asp Asn Ala Ile
325                     330                 335

gag gca tca act gaa att gat gac cct atc att cgc gtt gca ttt att       3571
Glu Ala Ser Thr Glu Ile Asp Asp Pro Ile Ile Arg Val Ala Phe Ile
340                     345                 350                 355
```

199

```
gaa agt gaa aat tca gta acg ttt att gtt atg aat aaa tgc gct gat     3619
Glu Ser Glu Asn Ser Val Thr Phe Ile Val Met Asn Lys Cys Ala Asp
            360                 365                 370

gat ata cca cgc att cat gaa ttg ttc caa gaa agt ttt tct act aaa     3667
Asp Ile Pro Arg Ile His Glu Leu Phe Gln Glu Ser Phe Ser Thr Lys
            375                 380                 385

ggt gaa ggt cgt ggt tta ggt cta tca act tta aaa gaa att gct gat     3715
Gly Glu Gly Arg Gly Leu Gly Leu Ser Thr Leu Lys Glu Ile Ala Asp
            390                 395                 400

aat gca gac aat gtc tta tta gat aca att atc gaa aat ggt ttc ttt     3763
Asn Ala Asp Asn Val Leu Leu Asp Thr Ile Ile Glu Asn Gly Phe Phe
            405                 410                 415

tat tca aaa agt tga aattattaac aactagccat aaggatgtga atgt atg aaa  3818
Tyr Ser Lys Ser                                             Met Lys
420                                                             425

att ttc att tgc gaa gac gat cca aaa caa aga gaa aac atg gtt acc     3866
Ile Phe Ile Cys Glu Asp Asp Pro Lys Gln Arg Glu Asn Met Val Thr
                430                 435                 440

att att aaa aat tat ata atg ata gaa gaa aag cct atg gaa att gcc     3914
Ile Ile Lys Asn Tyr Ile Met Ile Glu Glu Lys Pro Met Glu Ile Ala
            445                 450                 455

ctc gca act gat aat cct tat gag gtg ctt gag caa gct aaa aat atg     3962
Leu Ala Thr Asp Asn Pro Tyr Glu Val Leu Glu Gln Ala Lys Asn Met
            460                 465                 470

aat gac ata ggc tgt tac ttt tta gat att caa ctt tca act gat att     4010
Asn Asp Ile Gly Cys Tyr Phe Leu Asp Ile Gln Leu Ser Thr Asp Ile
            475                 480                 485

aat ggt atc aaa tta ggc agt gaa att cgt aag cat gac cca gtt ggt     4058
Asn Gly Ile Lys Leu Gly Ser Glu Ile Arg Lys His Asp Pro Val Gly
490                 495                 500                 505

aac att att ttc gtt acg agt cac agt gaa ctt acc tat tta aca ttt     4106
Asn Ile Ile Phe Val Thr Ser His Ser Glu Leu Thr Tyr Leu Thr Phe
                510                 515                 520

gtc tac aaa gtt gca gcg atg gat ttt att ttt aaa gat gat cca gct     4154
Val Tyr Lys Val Ala Ala Met Asp Phe Ile Phe Lys Asp Asp Pro Ala
            525                 530                 535

gaa tta aga act cga att ata gac tgt tta gaa act gca cat aca cgc     4202
Glu Leu Arg Thr Arg Ile Ile Asp Cys Leu Glu Thr Ala His Thr Arg
            540                 545                 550

tta caa ttg ttg tct aaa gat aat agc gtt gaa acg att gaa tta aaa     4250
Leu Gln Leu Leu Ser Lys Asp Asn Ser Val Glu Thr Ile Glu Leu Lys
            555                 560                 565
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)

200

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cgt ggc agt aat tca gtg tat gtt caa tat gat gat att atg ttt ttt      4298
Arg Gly Ser Asn Ser Val Tyr Val Gln Tyr Asp Asp Ile Met Phe Phe
570             575             580             585

gaa tca tca aca aaa tct cac aga ctc att gcc cat tta gat aac cgt      4346
Glu Ser Ser Thr Lys Ser His Arg Leu Ile Ala His Leu Asp Asn Arg
            590             595             600

caa att gaa ttt tat ggt aat tta aaa gaa ctg agt caa tta gat gat      4394
Gln Ile Glu Phe Tyr Gly Asn Leu Lys Glu Leu Ser Gln Leu Asp Asp
            605             610             615

cgt ttc ttt aga tgt cat aat agc ttt gtc gtc aat cgc cat aat att      4442
Arg Phe Phe Arg Cys His Asn Ser Phe Val Val Asn Arg His Asn Ile
        620             625             630

gaa tct ata gat tcg aaa gag cga att gtc tat ttt aaa aat aaa gaa      4490
Glu Ser Ile Asp Ser Lys Glu Arg Ile Val Tyr Phe Lys Asn Lys Glu
    635             640             645

cac tgc tat gca tcg gtg aga aac gtt aaa aaa ata taa taagataata      4539
His Cys Tyr Ala Ser Val Arg Asn Val Lys Lys Ile
650             655             660
```

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aagtcagtta acgacgtatt caattgtaaa tcttgttgga ttttaacaag ataactagca   4599

aatgcactgt atagctggct ttttaatttt attaacaaaa ttaaatatga cgcgtgaatt   4659

aaaaaatgat gtaacgtctc tttgtatacc tattcctatt actacataat ttatcaattt   4719

ctatttcact ctacaatcct atggcgcaat ttttaacaaa atatactaaa tttgaaattg   4779

acagtttcca taaataaaat gctataattt cctactccgt gaatcttatt ttgtttaaaa   4839

aaacagtgta gcacaagatt caacttgttt cctacactgt tttataaatg aattatttaa   4899

aatgcttgtt caacctcttg taatgttggc aaactattaa tagcaccata cttcgttgtc   4959

actattgcag caacgcgatt gctaaacgct aaaatttcct caccttcatt ttcaaataac   5019

tgagttaaat ttaacacatc ggttgctaaa atcctgctaa taactgcacc aataaatgca   5079

tcccctgccc cagttgtatc aacaggtttt accttatagc cactatgata atgattaata   5139

ccatttttca aatatacggc agcaccatct gctcccttcg tataaatgac tacagtaaca   5199

ttacctgtaa ataatgattg aatggcttca ttttcatcat gaatacctgt aataaattct   5259

aattcttcat ctgaaacttt tacaatatgc gccaatggca aaaggtatg aatagtttgt    5319

cttaaatctt cagcgttatc ccataatggc aatcttacat taggatcaaa tacgacagta   5379

ccatttgcat ttaatgtttt ggtaatcaat tgataatgtg catctctcat cggactatcg   5439

accaaatcaa cagaacaaaa atgtactaca tcattttcat tcacatcaat atcattcaca   5499
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201

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aaacttggtt caaataacat atcagcagag ggcttacgat aaaaagaaaa atctcgctcg    5559

cccgcttcag tcaaactcac aaaagctaac gcagtgtttg cttcattcgt gcgatacact    5619

tttgatacat ctacaccaat acttgatatc gtttcaataa tgctatctcc aaatgcatca    5679

ttacctaatt gtgtaatcat atacgcttgt tgtcctaact tttgaactgt acaagctaca    5739

ttgcatggcg cgccaccaat ttgcttcgta aatgtttgaa catcttttaa attcgcattt    5799

gtaacatttg gaataaaatc aattaacgct ctcctattg aaaatagacg tctcatttat     5859

gttcatcctt taaatcatat ttagtaaatt gtaaatatac ttgccctgat tctgttgatg    5919

ttttaatacc tagtgcgtct tctgtcggga aaattcgaga tgtcaaaaca cgttctccat  . 5979

cattacagaa aatttctata ctagatgtat caacaaaaat ttgtaattgc tttaatggcg    6039

tgtctaatat cgtactacgc gtcgtacctt caacatttgt cggcaataaa ccactgtcgc    6099

tgcgatcc                                                             6107
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<210> 103
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<213> Staphylococcus aureus

<400> 103

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Val Glu Leu Leu Asn Ser Tyr Asn Phe Val Leu Phe Val Leu Thr Gln
1               5                  10                  15


Met Ile Leu Met Phe Thr Ile Pro Ala Ile Ile Ser Gly Ile Lys Tyr
            20                  25                  30


Ser Lys Leu Asp Tyr Phe Phe Ile Ile Val Ile Ser Thr Leu Ser Leu
        35                  40                  45


Phe Leu Phe Lys Met Phe Asp Ser Ala Ser Leu Ile Ile Leu Thr Ser
    50                  55                  60


Phe Ile Ile Ile Met Tyr Phe Val Lys Ile Lys Trp Tyr Ser Ile Leu
65                  70                  75                  80


Leu Ile Met Thr Ser Gln Ile Ile Leu Tyr Cys Ala Asn Tyr Met Tyr
                85                  90                  95
```

202

```
Ile Val Ile Tyr Ala Tyr Ile Thr Lys Ile Ser Asp Ser Ile Phe Val
            100                 105             110

Ile Phe Pro Ser Phe Phe Val Val Tyr Val Thr Ile Ser Ile Leu Phe
            115                 120             125

Ser Tyr Ile Ile Asn Arg Val Leu Lys Lys Ile Ser Thr Pro Tyr Leu
            130                 135             140

Ile Leu Asn Lys Gly Phe Leu Ile Val Ile Ser Thr Ile Leu Leu Leu
145                 150             155             160

Thr Phe Ser Leu Phe Phe Phe Tyr Ser Gln Ile Asn Ser Asp Glu Ala
                165                 170             175

Lys Val Ile Arg Gln Tyr Ser Leu Phe Tyr Trp Tyr His Tyr Ile Leu
                180                 185             190

Ser Ile Leu Thr Leu Tyr Ser Gln Phe Leu Leu Lys Glu Met Lys Tyr
                195                 200             205

Lys Arg Asn Gln Glu Glu Ile Glu Thr Tyr Tyr Glu Tyr Thr Leu Lys
        210                 215             220

Ile Glu Ala Ile Asn Asn Glu Met Arg Lys Phe Arg His Asp Tyr Val
225                 230             235             240

Asn Ile Leu Thr Thr Leu Ser Glu Tyr Ile Arg Glu Asp Asp Met Pro
                245                 250             255

Gly Leu Arg Asp Tyr Phe Asn Lys Asn Ile Val Pro Met Lys Asp Asn
            260                 265             270

Leu Gln Met Asn Ala Ile Lys Leu Asn Gly Ile Glu Asn Leu Lys Val
            275                 280             285

Arg Glu Ile Lys Gly Leu Ile Thr Ala Lys Ile Leu Arg Ala Gln Glu
        290                 295             300

Met Asn Ile Pro Ile Ser Ile Glu Ile Pro Asp Glu Val Ser Ser Ile
305                 310             315             320
```

203

Asn Leu Asn Met Ile Asp Leu Ser Arg Ser Ile Gly Ile Ile Leu Asp
              325   330   335

Asn Ala Ile Glu Ala Ser Thr Glu Ile Asp Asp Pro Ile Ile Arg Val
              340   345   350

Ala Phe Ile Glu Ser Glu Asn Ser Val Thr Phe Ile Val Met Asn Lys
              355   360   365

Cys Ala Asp Asp Ile Pro Arg Ile His Glu Leu Phe Gln Glu Ser Phe
     370   375   380

Ser Thr Lys Gly Glu Gly Arg Gly Leu Gly Leu Ser Thr Leu Lys Glu
385   390   395   400

Ile Ala Asp Asn Ala Asp Asn Val Leu Leu Asp Thr Ile Ile Glu Asn
              405   410   415

Gly Phe Phe Tyr Ser Lys Ser
              420

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<211> 238
<212> PRT
<213> Staphylococcus aureus

<400> 104

Met Lys Ile Phe Ile Cys Glu Asp Asp Pro Lys Gln Arg Glu Asn Met
1   5   10   15

Val Thr Ile Ile Lys Asn Tyr Ile Met Ile Glu Glu Lys Pro Met Glu
              20   25   30

Ile Ala Leu Ala Thr Asp Asn Pro Tyr Glu Val Leu Glu Gln Ala Lys
              35   40   45

Asn Met Asn Asp Ile Gly Cys Tyr Phe Leu Asp Ile Gln Leu Ser Thr
     50   55   60

Asp Ile Asn Gly Ile Lys Leu Gly Ser Glu Ile Arg Lys His Asp Pro
65   70   75   80

204

```
Val Gly Asn Ile Ile Phe Val Thr Ser His Ser Glu Leu Thr Tyr Leu
                85                  90                  95

Thr Phe Val Tyr Lys Val Ala Ala Met Asp Phe Ile Phe Lys Asp Asp
            100                 105                 110

Pro Ala Glu Leu Arg Thr Arg Ile Ile Asp Cys Leu Glu Thr Ala His
            115                 120                 125

Thr Arg Leu Gln Leu Leu Ser Lys Asp Asn Ser Val Glu Thr Ile Glu
        130                 135                 140

Leu Lys Arg Gly Ser Asn Ser Val Tyr Val Gln Tyr Asp Asp Ile Met
145                 150                 155                 160

Phe Phe Glu Ser Ser Thr Lys Ser His Arg Leu Ile Ala His Leu Asp
                165                 170                 175

Asn Arg Gln Ile Glu Phe Tyr Gly Asn Leu Lys Glu Leu Ser Gln Leu
            180                 185                 190

Asp Asp Arg Phe Phe Arg Cys His Asn Ser Phe Val Val Asn Arg His
        195                 200                 205

Asn Ile Glu Ser Ile Asp Ser Lys Glu Arg Ile Val Tyr Phe Lys Asn
    210                 215                 220

Lys Glu His Cys Tyr Ala Ser Val Arg Asn Val Lys Lys Ile
225                 230                 235


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205

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cattactttt cccgtttttg acttaaatag cttcagtttg gtctgatctg ccgctacatc     120

ttcatttttt ttgtattttt atgcgattca ttgaaactcg gccccatttt caaatctaca     180

taggccgtac tgacattatc gaaatgctat tttttatcta tttgattttt atgattaaag     240

tatattttgt gtataaaaat cattcgggtc ggattgctgc gaaagaaatg atacactagc     300

acgtcaaagt aagtgcgtta tcagtattca ggtagctgtt gagcctgggg cggtagcgtg     360

cttttttctg cttaacttaa ccagacaatc acacaaaaga gtcgctagtg gaaaagccat     420

ttcgaaaaat cctggtcata aag atg cga tat cat ggg gat atg tta tta act     473
                          Met Arg Tyr His Gly Asp Met Leu Leu Thr
                          1           5                       10

act cct gtc atc agt acg ctc aag cag aat tat cct gat gca aaa atc     521
Thr Pro Val Ile Ser Thr Leu Lys Gln Asn Tyr Pro Asp Ala Lys Ile
              15                  20                  25

gat atg ctg ctt tat cag gac acc atc cct att ttg tct gaa aac ccg     569
Asp Met Leu Leu Tyr Gln Asp Thr Ile Pro Ile Leu Ser Glu Asn Pro
          30                  35                  40

gaa att aat gcg ctc tat ggg ata agc aat aaa ggt gcg gga act ttc     617
Glu Ile Asn Ala Leu Tyr Gly Ile Ser Asn Lys Gly Ala Gly Thr Phe
          45                  50                  55
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206

```
gat aaa att aaa aat gtg ctt tcg ttg ata aaa act ctg cgt gcg aat     665
Asp Lys Ile Lys Asn Val Leu Ser Leu Ile Lys Thr Leu Arg Ala Asn
    60                  65                  70

aat tat gac ctg gtc att aat ctt acg gat cag tgg atg gtg gcg ctg     713
Asn Tyr Asp Leu Val Ile Asn Leu Thr Asp Gln Trp Met Val Ala Leu
75                  80                  85                  90

ctg gta cgt tgt tta cct gca cgg atg aaa ata tcg caa ctt tat ggt     761
Leu Val Arg Cys Leu Pro Ala Arg Met Lys Ile Ser Gln Leu Tyr Gly
                95                  100                 105

cat cgg cag cat ggt att tgg aaa aaa agc ttc aca cac tta gcg cca     809
His Arg Gln His Gly Ile Trp Lys Lys Ser Phe Thr His Leu Ala Pro
                110                 115                 120

ata cac ggt aca cat att gtt gag cgt aat tta tcg gtc ctt gag cca     857
Ile His Gly Thr His Ile Val Glu Arg Asn Leu Ser Val Leu Glu Pro
                125                 130                 135

tta ggt att acc gat ttc tac acc gac aca aca atg agt tac gcc gaa     905
Leu Gly Ile Thr Asp Phe Tyr Thr Asp Thr Thr Met Ser Tyr Ala Glu
    140                 145                 150

gat tgc tgg aag aag atg cgc cgg gaa tta gat gcc ctg ggc gta aaa     953
Asp Cys Trp Lys Lys Met Arg Arg Glu Leu Asp Ala Leu Gly Val Lys
155                 160                 165                 170

gat cat tat gtt gtc atc caa ccg aca gcg cgt cag ata ttt aag tgt     1001
Asp His Tyr Val Val Ile Gln Pro Thr Ala Arg Gln Ile Phe Lys Cys
                175                 180                 185

tgg gat aac gat aaa ttt tct aag gtt atc gat gcg ctg caa cag cga     1049
Trp Asp Asn Asp Lys Phe Ser Lys Val Ile Asp Ala Leu Gln Gln Arg
                190                 195                 200

ggc tat cag gtt gtg cta acc tgt ggg ccc tcg gca gat gat ctc gct     1097
Gly Tyr Gln Val Val Leu Thr Cys Gly Pro Ser Ala Asp Asp Leu Ala
                205                 210                 215

tgt gta gat gag att gca cga ggt tgc gaa aca aaa ccc att act ggc     1145
Cys Val Asp Glu Ile Ala Arg Gly Cys Glu Thr Lys Pro Ile Thr Gly
    220                 225                 230

ctt gca ggt aaa aca cgt ttt cct gaa ctg ggt gca tta att gat cat     1193
Leu Ala Gly Lys Thr Arg Phe Pro Glu Leu Gly Ala Leu Ile Asp His
235                 240                 245                 250

gca gtg ctt ttt att ggt gtg gat tct gcg ccg gga cat att gca gcg     1241
Ala Val Leu Phe Ile Gly Val Asp Ser Ala Pro Gly His Ile Ala Ala
                255                 260                 265

gca gtg aaa acg cca gtc att agt cta ttt ggt gca acg gat cac gta     1289
Ala Val Lys Thr Pro Val Ile Ser Leu Phe Gly Ala Thr Asp His Val
                270                 275                 280
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207

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ttc tgg cgt ccc tgg acc gag aat att att caa ttc tgg gcg ggg aat      1337
Phe Trp Arg Pro Trp Thr Glu Asn Ile Ile Gln Phe Trp Ala Gly Asn
        285             290             295

tat cag aaa atg ccg acc cgg cat gaa ctt gac cgc aac aaa aaa tat      1385
Tyr Gln Lys Met Pro Thr Arg His Glu Leu Asp Arg Asn Lys Lys Tyr
        300             305             310

ctt tct gtt atc cca gcg gag gat gtg atc gcc gct acg gaa aag ctg      1433
Leu Ser Val Ile Pro Ala Glu Asp Val Ile Ala Ala Thr Glu Lys Leu
315             320             325             330

ttg cca gaa gat gcc cct tca gct gac agg aat gca caa tta tg atc      1480
Leu Pro Glu Asp Ala Pro Ser Ala Asp Arg Asn Ala Gln Leu      Ile
                335             340             345

gtg gcg ttt tgt tta tat aaa tat ttt cca ttt ggt ggg ctt caa cgt      1528
Val Ala Phe Cys Leu Tyr Lys Tyr Phe Pro Phe Gly Gly Leu Gln Arg
            350             355             360

gac ttt atg cgc att gca tca aca gtt gcc gca cgg ggc cac cat gtt      1576
Asp Phe Met Arg Ile Ala Ser Thr Val Ala Ala Arg Gly His His Val
            365             370             375

cgg gta tat aca cag tcg tgg gaa ggc gat tgc ccg aaa gca ttt gag      1624
Arg Val Tyr Thr Gln Ser Trp Glu Gly Asp Cys Pro Lys Ala Phe Glu
            380             385             390

ctt att cag gtg cca gtt aag tcc cat acc aac cat gga cgc aat gca      1672
Leu Ile Gln Val Pro Val Lys Ser His Thr Asn His Gly Arg Asn Ala
            395             400             405

gaa tat tat gcc tgg gta caa aat cat ctc aaa gag cat ccc gca gat      1720
Glu Tyr Tyr Ala Trp Val Gln Asn His Leu Lys Glu His Pro Ala Asp
410             415             420             425

cgc gtt gtt ggg ttt aat aag atg cct ggc ctg gat gtt tat ttt gcc      1768
Arg Val Val Gly Phe Asn Lys Met Pro Gly Leu Asp Val Tyr Phe Ala
            430             435             440

gct gat gtt tgt tac gcc gag aaa gtt gcg caa gaa aaa ggt ttt tta      1816
Ala Asp Val Cys Tyr Ala Glu Lys Val Ala Gln Glu Lys Gly Phe Leu
            445             450             455

tat cgt tta aca tca cga tat cgc cat tat gcc gca ttt gag cga gcg      1864
Tyr Arg Leu Thr Ser Arg Tyr Arg His Tyr Ala Ala Phe Glu Arg Ala
            460             465             470

act ttc gag cag ggt aaa tcg acg aaa ctt atg atg ctg acc gat aag      1912
Thr Phe Glu Gln Gly Lys Ser Thr Lys Leu Met Met Leu Thr Asp Lys
475             480             485

caa atc gcc gat ttc cag aag cat tat caa act gaa cct gaa cgt ttt      1960
Gln Ile Ala Asp Phe Gln Lys His Tyr Gln Thr Glu Pro Glu Arg Phe
490             495             500             505
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208

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caa att ctt cct ccc ggt att tat ccg gac aga aaa tac agt gag caa    2008
Gln Ile Leu Pro Pro Gly Ile Tyr Pro Asp Arg Lys Tyr Ser Glu Gln
            510             515             520

atc cca aac agc cgt gaa att tat cgc cag aaa aat ggc ata aaa gag    2056
Ile Pro Asn Ser Arg Glu Ile Tyr Arg Gln Lys Asn Gly Ile Lys Glu
            525             530             535

caa caa aac tta tta ctg cag gtt gga tca gat ttt ggc cgt aaa ggt    2104
Gln Gln Asn Leu Leu Leu Gln Val Gly Ser Asp Phe Gly Arg Lys Gly
            540             545             550

gta gat cgc tca att gaa gct ttg gca tcg tta ccg gaa tca tta cgt    2152
Val Asp Arg Ser Ile Glu Ala Leu Ala Ser Leu Pro Glu Ser Leu Arg
            555             560             565

cac aat acg ctt tta ttt gtt gtt ggt cag gat aag ccg cga aaa ttt    2200
His Asn Thr Leu Leu Phe Val Val Gly Gln Asp Lys Pro Arg Lys Phe
570             575             580             585

gaa gcg ctg gca gaa aaa ctc ggc gtg cgg agc aat gtg cat ttc ttc    2248
Glu Ala Leu Ala Glu Lys Leu Gly Val Arg Ser Asn Val His Phe Phe
            590             595             600

tcc ggt cgc aat gat gtg tca gaa tta atg gca gcc gct gat tta tta    2296
Ser Gly Arg Asn Asp Val Ser Glu Leu Met Ala Ala Ala Asp Leu Leu
            605             610             615

ctg cat ccc gct tat cag gaa gcc gcg ggt atc gtt ctt cta gaa gcg    2344
Leu His Pro Ala Tyr Gln Glu Ala Ala Gly Ile Val Leu Leu Glu Ala
            620             625             630

atc act gct ggg tta cct gtt tta aca aca gcg gta tgt ggg tac gcg    2392
Ile Thr Ala Gly Leu Pro Val Leu Thr Thr Ala Val Cys Gly Tyr Ala
            635             640             645

cat tat att gcg gat gcc aat tgt gga acg gtc atc gct gaa cct ttc    2440
His Tyr Ile Ala Asp Ala Asn Cys Gly Thr Val Ile Ala Glu Pro Phe
650             655             660             665

tct cag gaa caa tta aat gaa gtt tta cgt aaa gcg tta act cag tcg    2488
Ser Gln Glu Gln Leu Asn Glu Val Leu Arg Lys Ala Leu Thr Gln Ser
            670             675             680

cca ttg cga atg gcc tgg gcg gag aat gct cgc cat tat gcc gat act    2536
Pro Leu Arg Met Ala Trp Ala Glu Asn Ala Arg His Tyr Ala Asp Thr
            685             690             695

cag gat ttg tat agc ttg cca gaa aaa gcc gcg gat atc att aca ggt    2584
Gln Asp Leu Tyr Ser Leu Pro Glu Lys Ala Ala Asp Ile Ile Thr Gly
            700             705             710

ggt tta g atg gtt gaa tta aaa gag ccg ctt gcc aca ctt tgg cgt ggt 2633
Gly Leu     Met Val Glu Leu Lys Glu Pro Leu Ala Thr Leu Trp Arg Gly
            715             720             725
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209

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aaa gat gct ttt gca gag gtc aaa aaa ctg aac ggc gag gtc ttt cgt      2681
Lys Asp Ala Phe Ala Glu Val Lys Lys Leu Asn Gly Glu Val Phe Arg
730                 735                 740                 745

gaa ctg gag act cgt cgt aca tta cgc ttt gaa ctg tcc ggg aaa agc      2729
Glu Leu Glu Thr Arg Arg Thr Leu Arg Phe Glu Leu Ser Gly Lys Ser
                    750                 755                 760

tat ttt ctt aaa tgg cac aag ggg acg aca tta aaa gag att ata aaa      2777
Tyr Phe Leu Lys Trp His Lys Gly Thr Thr Leu Lys Glu Ile Ile Lys
                765                 770                 775

aat cta ctc tca ttg cgg atg ccc gtt ttg ggc gca gac aga gag tgg      2825
Asn Leu Leu Ser Leu Arg Met Pro Val Leu Gly Ala Asp Arg Glu Trp
            780                 785                 790

cac gct att cat cgc ctg agt gat gtt ggc gtt gat aca atg aag ggc      2873
His Ala Ile His Arg Leu Ser Asp Val Gly Val Asp Thr Met Lys Gly
        795                 800                 805

att ggg ttt ggc gaa aaa ggg tta aat cca tta act cgc gca tca ttt      2921
Ile Gly Phe Gly Glu Lys Gly Leu Asn Pro Leu Thr Arg Ala Ser Phe
810                 815                 820                 825

att att acc gaa gat ctc act ccc aca att agc ctt gaa gat tat tgt      2969
Ile Ile Thr Glu Asp Leu Thr Pro Thr Ile Ser Leu Glu Asp Tyr Cys
                830                 835                 840

gcc gat tgg gca gtc aac ccg cct gat ata cgt gtt aag cgt atg ctg      3017
Ala Asp Trp Ala Val Asn Pro Pro Asp Ile Arg Val Lys Arg Met Leu
                845                 850                 855

atc gca cgt gta gca act atg gtg cgt aaa atg cat act gca ggg ata      3065
Ile Ala Arg Val Ala Thr Met Val Arg Lys Met His Thr Ala Gly Ile
                860                 865                 870

aat cac cgc gac tgt tac att tgc cac ttt ttg ctt cat ttg cca ttt      3113
Asn His Arg Asp Cys Tyr Ile Cys His Phe Leu Leu His Leu Pro Phe
        875                 880                 885

act ggc cgg gaa gat gaa tta aaa att tca gtt atc gat ctg cat cgg      3161
Thr Gly Arg Glu Asp Glu Leu Lys Ile Ser Val Ile Asp Leu His Arg
890                 895                 900                 905

gca cag ata cgt gca aaa gta ccg cgc cgc tgg cgc gat aaa gac ctg      3209
Ala Gln Ile Arg Ala Lys Val Pro Arg Arg Trp Arg Asp Lys Asp Leu
                910                 915                 920

att ggt tta tat ttc tca tca atg aat att ggc ctg acg caa aga gat      3257
Ile Gly Leu Tyr Phe Ser Ser Met Asn Ile Gly Leu Thr Gln Arg Asp
                925                 930                 935

atc tgg cga ttt atg aag gtt tat ttt ggg atg cct tta cgc aaa ata      3305
Ile Trp Arg Phe Met Lys Val Tyr Phe Gly Met Pro Leu Arg Lys Ile
                940                 945                 950
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210

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ttg tct ctt gaa cag aat tta ttg aac atg gca agc gtt aag gcc gag        3353
Leu Ser Leu Glu Gln Asn Leu Leu Asn Met Ala Ser Val Lys Ala Glu
    955             960             965

cgt att aaa gag cga aca caa cgc aaa gga tta taaaaatatt tattagtatg      3406
Arg Ile Lys Glu Arg Thr Gln Arg Lys Gly Leu
970             975             980

tactggaact aactttatt atg act att tat ttt ata aat tgg gtt gca gat       3458
                      Met Thr Ile Tyr Phe Ile Asn Trp Val Ala Asp
                                      985             990

tat gaa tta aaa atg att cag tac ctg aaa aaa aag tac aag ata aaa        3506
Tyr Glu Leu Lys Met Ile Gln Tyr Leu Lys Lys Lys Tyr Lys Ile Lys
            995             1000            1005

aat ata aca aca cca aaa aaa tat aac tgg att aat aaa aaa ata            3551
Asn Ile Thr Thr Pro Lys Lys Tyr Asn Trp Ile Asn Lys Lys Ile
        1010            1015            1020

tca aaa ata ggg atg gat aat gca tgg ctg ggg cga tta ttc atc           3596
Ser Lys Ile Gly Met Asp Asn Ala Trp Leu Gly Arg Leu Phe Ile
        1025            1030            1035

aag cat tac ctc aat gat att aaa aaa gat gac ata att atc att           3641
Lys His Tyr Leu Asn Asp Ile Lys Lys Asp Asp Ile Ile Ile Ile
        1040            1045            1050

aat gac agt gtt gtt aat aaa ggt atc aat aaa caa ata tta aaa           3686
Asn Asp Ser Val Val Asn Lys Gly Ile Asn Lys Gln Ile Leu Lys
        1055            1060            1065

aat att aac tgt cat aaa gtt ttg ctt cta aga aat act gtt ggc           3731
Asn Ile Asn Cys His Lys Val Leu Leu Leu Arg Asn Thr Val Gly
        1070            1075            1080

gaa gat ttt att ctt gat aac gcg aat tat ttc gat att ata tat          3776
Glu Asp Phe Ile Leu Asp Asn Ala Asn Tyr Phe Asp Ile Ile Tyr
        1085            1090            1095

gat ttt gag cat aga ttt ata ggg aat gaa aag atc aag gca ata           3821
Asp Phe Glu His Arg Phe Ile Gly Asn Glu Lys Ile Lys Ala Ile
        1100            1105            1110

gaa caa ttt ttt cct ata gga atg gat gaa att aga aat tat agt           3866
Glu Gln Phe Phe Pro Ile Gly Met Asp Glu Ile Arg Asn Tyr Ser
        1115            1120            1125

tta tct gac aaa aat aac agc cag cca ata tgt ttt ttc ctt ggt           3911
Leu Ser Asp Lys Asn Asn Ser Gln Pro Ile Cys Phe Phe Leu Gly
        1130            1135            1140

cgt gat aaa ggg cgt ctt caa ata att aat gag tta gcc gag aga           3956
Arg Asp Lys Gly Arg Leu Gln Ile Ile Asn Glu Leu Ala Glu Arg
        1145            1150            1155
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211

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tta aca aca  cta gga tgt aag  cta gat ttt aat gtt  gtc aaa gat        4001
Leu Thr Thr  Leu Gly Cys Lys  Leu Asp Phe Asn Val  Val Lys Asp
        1160             1165            1170

aag aca tca  tct acg act tca  aag tat ttg att gaa  aaa caa ata        4046
Lys Thr Ser  Ser Thr Thr Ser  Lys Tyr Leu Ile Glu  Lys Gln Ile
        1175             1180            1185

tct tat gaa  gag aat att aga  aga aca tta aat gct  aat ata att        4091
Ser Tyr Glu  Glu Asn Ile Arg  Arg Thr Leu Asn Ala  Asn Ile Ile
        1190             1195            1200

gtt gat ata  acc aaa gaa aac  caa tct ggc tgg act  ctt cgt ata        4136
Val Asp Ile  Thr Lys Glu Asn  Gln Ser Gly Trp Thr  Leu Arg Ile
        1205             1210            1215

ctt gag gca  cta ttt ttc aat  aaa aaa tta att act  aat aat ata        4181
Leu Glu Ala  Leu Phe Phe Asn  Lys Lys Leu Ile Thr  Asn Asn Ile
        1220             1225            1230

aat gta ttt  ggt tca gaa atc  tat agt gaa tct cgc  ttt ttt ata        4226
Asn Val Phe  Gly Ser Glu Ile  Tyr Ser Glu Ser Arg  Phe Phe Ile
        1235             1240            1245

ata ggt cat  gat gat tgg gat  aag tta gag tat ttt  att aac tca        4271
Ile Gly His  Asp Asp Trp Asp  Lys Leu Glu Tyr Phe  Ile Asn Ser
        1250             1255            1260

tct gtt aaa  cca atg gat tat  gat agt tta tat aaa  ttc agt cca        4316
Ser Val Lys  Pro Met Asp Tyr  Asp Ser Leu Tyr Lys  Phe Ser Pro
        1265             1270            1275

gat aaa atg  atg tca acg att  gtt tct gat ttt ata  gac aaa taa        4361
Asp Lys Met  Met Ser Thr Ile  Val Ser Asp Phe Ile  Asp Lys
        1280             1285            1290

aaccgttaaa aca gtg agt ttt act  caa tta atg aga gtt  tct atg aaa      4410
           Val Ser Phe Thr  Gln Leu Met Arg Val  Ser Met Lys
                   1295             1300

ata gcg  ttt atc ggc gaa gct  gtt tct gga ttt ggc  ggc atg gaa        4455
Ile Ala  Phe Ile Gly Glu Ala  Val Ser Gly Phe Gly  Gly Met Glu
     1305             1310            1315

act gtc  atc cgt gat gtt att  act acc ttc agg caa  caa cat atc        4500
Thr Val  Ile Arg Asp Val Ile  Thr Thr Phe Arg Gln  Gln His Ile
     1320             1325            1330

caa agt  gaa atg ttt ttc ttt  tgt cgt aat gac aaa  atg gat aag        4545
Gln Ser  Glu Met Phe Phe Phe  Cys Arg Asn Asp Lys  Met Asp Lys
     1335             1340            1345

gga tgg  ctg gaa ggt att aaa  tac tca tgt tca ttt  tcc aat att        4590
Gly Trp  Leu Glu Gly Ile Lys  Tyr Ser Cys Ser Phe  Ser Asn Ile
     1350             1355            1360
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212

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cgt tta ggt ttt ttg cgt cgg  gcg aaa cat att cat  gct cta agt      4635
Arg Leu Gly Phe Leu Arg Arg  Ala Lys His Ile His  Ala Leu Ser
    1365             1370              1375

aaa tgg ctt cag gag tac caa  cca gat atc gtt att  tgt att gat      4680
Lys Trp Leu Gln Glu Tyr Gln  Pro Asp Ile Val Ile  Cys Ile Asp
    1380             1385              1390

gtg atc tcc tgc ctg ttt gcc  gca aaa gca cgt aaa  aaa tca gga      4725
Val Ile Ser Cys Leu Phe Ala  Ala Lys Ala Arg Lys  Lys Ser Gly
    1395             1400              1405

att gat atg cca gta ttt tca  tgg cca cat ttt tct  tta gat cac      4770
Ile Asp Met Pro Val Phe Ser  Trp Pro His Phe Ser  Leu Asp His
    1410             1415              1420

aaa aaa cat gct gaa tat atc  acc tgt gcc gac tat  cat tta gca      4815
Lys Lys His Ala Glu Tyr Ile  Thr Cys Ala Asp Tyr  His Leu Ala
    1425             1430              1435

atc agc tct ggc att aaa cag  caa atg att aat cga  ggt gta gca      4860
Ile Ser Ser Gly Ile Lys Gln  Gln Met Ile Asn Arg  Gly Val Ala
    1440             1445              1450

gaa tcg acg ata aat gtt att  ttt aat ccc gtc gaa  act aaa gac      4905
Glu Ser Thr Ile Asn Val Ile  Phe Asn Pro Val Glu  Thr Lys Asp
    1455             1460              1465

tca gtc att ccc gcg ccc gag  gaa ggt gaa acg gca  acg ttt att      4950
Ser Val Ile Pro Ala Pro Glu  Glu Gly Glu Thr Ala  Thr Phe Ile
    1470             1475              1480

tat gtt ggg cgt atg aaa ttt  gaa ggc cag aaa aga  gtt aaa gac      4995
Tyr Val Gly Arg Met Lys Phe  Glu Gly Gln Lys Arg  Val Lys Asp
    1485             1490              1495

ctg ctt gat ggc tta tca caa  gcg aaa ggt aac tgg  aaa ctc cat      5040
Leu Leu Asp Gly Leu Ser Gln  Ala Lys Gly Asn Trp  Lys Leu His
    1500             1505              1510

gta ttg ggt gat ggc tcc gat  ttc gaa aaa tgc cag  gct tat ggt      5085
Val Leu Gly Asp Gly Ser Asp  Phe Glu Lys Cys Gln  Ala Tyr Gly
    1515             1520              1525

aga gaa tta aat att gat gat  cga att gtc tgg tat  ggt tgg caa      5130
Arg Glu Leu Asn Ile Asp Asp  Arg Ile Val Trp Tyr  Gly Trp Gln
    1530             1535              1540

caa tat ccc tgg gaa ttg gtc  cag caa gat att gaa  aaa gtg agt      5175
Gln Tyr Pro Trp Glu Leu Val  Gln Gln Asp Ile Glu  Lys Val Ser
    1545             1550              1555

gcg tta ttg ctc acg tca tct  ttt gaa ggt ttc cca  atg acc cta      5220
Ala Leu Leu Leu Thr Ser Ser  Phe Glu Gly Phe Pro  Met Thr Leu
    1560             1565              1570
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213

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ctt gaa  gcc ttg tcg tgg ggg  att cct tgt atc agt  gcc gat tgt      5265
Leu Glu  Ala Leu Ser Trp Gly  Ile Pro Cys Ile Ser  Ala Asp Cys
    1575             1580                1585

gtc tcc  ggg cct gct gac att  att caa cct gat gtc  aat ggc cat      5310
Val Ser  Gly Pro Ala Asp Ile  Ile Gln Pro Asp Val  Asn Gly His
    1590             1595                1600

ctg tat  caa ccg gga gat att  gct ggt ttt gta act  ctt cta aat      5355
Leu Tyr  Gln Pro Gly Asp Ile  Ala Gly Phe Val Thr  Leu Leu Asn
    1605             1610                1615

aaa tat  ata gca ggt gaa att  cat atc gaa cat gaa  aaa att cct      5400
Lys Tyr  Ile Ala Gly Glu Ile  His Ile Glu His Glu  Lys Ile Pro
    1620             1625                1630

gcg tcg  atc gat gaa ttt tac  caa tcg aag tat tac  gat aga tta      5445
Ala Ser  Ile Asp Glu Phe Tyr  Gln Ser Lys Tyr Tyr  Asp Arg Leu
    1635             1640                1645

cat aag  gta att att tct gct  att tcc cgg agg aaa  ta atg cag cag   5492
His Lys  Val Ile Ile Ser Ala  Ile Ser Arg Arg Lys     Met Gln Gln
    1650             1655                1660

gtg ttt  ttc cag gaa act gag  ttt ctt aat tca gtt  att gat tat      5537
Val Phe  Phe Gln Glu Thr Glu  Phe Leu Asn Ser Val  Ile Asp Tyr
    1665             1670                1675

gat cat  aaa gta gaa aca gaa  aat ctt tgt ctg gac  atc gct tat      5582
Asp His  Lys Val Glu Thr Glu  Asn Leu Cys Leu Asp  Ile Ala Tyr
    1680             1685                1690

gga act  gac aaa aac ttt cta  ttt ggt tgc gga att  tcg att gct      5627
Gly Thr  Asp Lys Asn Phe Leu  Phe Gly Cys Gly Ile  Ser Ile Ala
    1695             1700                1705

tca ata  tta aaa tat aat gaa  gga agt cga ttg tgt  ttc cat att      5672
Ser Ile  Leu Lys Tyr Asn Glu  Gly Ser Arg Leu Cys  Phe His Ile
    1710             1715                1720

ttt act  gat tat ttt ggt gat  gat gat cgt aag tat  ttt gat gcc      5717
Phe Thr  Asp Tyr Phe Gly Asp  Asp Asp Arg Lys Tyr  Phe Asp Ala
    1725             1730                1735

ctg gcg  ttg cag tat aaa acc  aga att aaa ata tat  ctg att aat      5762
Leu Ala  Leu Gln Tyr Lys Thr  Arg Ile Lys Ile Tyr  Leu Ile Asn
    1740             1745                1750

ggt gat  cga ctg cgc tca ttg  cct agc act aag aat  tgg act cat      5807
Gly Asp  Arg Leu Arg Ser Leu  Pro Ser Thr Lys Asn  Trp Thr His
    1755             1760                1765

gca ata  tat ttt cgt ttt gtt  att gca gat tac ttt  att aat aag      5852
Ala Ile  Tyr Phe Arg Phe Val  Ile Ala Asp Tyr Phe  Ile Asn Lys
    1770             1775                1780
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214

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gcg cct  aaa gtc ctt tat ctg  gat gca gat atc att  tgt cag ggg      5897
Ala Pro  Lys Val Leu Tyr Leu  Asp Ala Asp Ile Ile  Cys Gln Gly
    1785             1790                1795

act att  gag cca cta att aat  ttc tca ttt cct gac  gat aaa gtc      5942
Thr Ile  Glu Pro Leu Ile Asn  Phe Ser Phe Pro Asp  Asp Lys Val
    1800             1805                1810

gca atg  gtt gtt aca gaa ggg  caa gct gac tgg tgg  gaa aaa cgc      5987
Ala Met  Val Val Thr Glu Gly  Gln Ala Asp Trp Trp  Glu Lys Arg
    1815             1820                1825

gcc cat  tcg tta ggt gtt gcg  gga att gct aaa ggt  tac ttt aac      6032
Ala His  Ser Leu Gly Val Ala  Gly Ile Ala Lys Gly  Tyr Phe Asn
    1830             1835                1840

tcc ggt  ttt tta ttg att aat  act gcc caa tgg gcg  gct cag cag      6077
Ser Gly  Phe Leu Leu Ile Asn  Thr Ala Gln Trp Ala  Ala Gln Gln
    1845             1850                1855

gtt tct  gca cga gct att gca  atg cta aat gag cca  gaa ata atc      6122
Val Ser  Ala Arg Ala Ile Ala  Met Leu Asn Glu Pro  Glu Ile Ile
    1860             1865                1870

aaa aaa  ata aca cat cct gat  cag gat gtg tta aat  atg ttg ctg      6167
Lys Lys  Ile Thr His Pro Asp  Gln Asp Val Leu Asn  Met Leu Leu
    1875             1880                1885

gcg gat  aaa ctt att ttc gct  gat att aaa tat aac  acc cag ttc      6212
Ala Asp  Lys Leu Ile Phe Ala  Asp Ile Lys Tyr Asn  Thr Gln Phe
    1890             1895                1900

agc tta  aat tat caa ctc aaa  gaa agc ttt ata aac  cca gta acc      6257
Ser Leu  Asn Tyr Gln Leu Lys  Glu Ser Phe Ile Asn  Pro Val Thr
    1905             1910                1915

aac gat  act att ttt atc cat  tat atc ggg cca acc  aag ccc tgg      6302
Asn Asp  Thr Ile Phe Ile His  Tyr Ile Gly Pro Thr  Lys Pro Trp
    1920             1925                1930

cat gat  tgg gcc tgg gat tat  cct gta tca caa gcc  ttt atg gag      6347
His Asp  Trp Ala Trp Asp Tyr  Pro Val Ser Gln Ala  Phe Met Glu
    1935             1940                1945

gca aaa  aat gct tcg cca tgg  aag aat acg gcg ttg  ctg aaa ccg      6392
Ala Lys  Asn Ala Ser Pro Trp  Lys Asn Thr Ala Leu  Leu Lys Pro
    1950             1955                1960

aac aat  agc aat caa tta aga  tat agc gca aaa cat  atg ctt aaa      6437
Asn Asn  Ser Asn Gln Leu Arg  Tyr Ser Ala Lys His  Met Leu Lys
    1965             1970                1975

aag cat  aga tat cta aaa gga  ttt agc aac tat ctt  ttt tat ttt      6482
Lys His  Arg Tyr Leu Lys Gly  Phe Ser Asn Tyr Leu  Phe Tyr Phe
    1980             1985                1990
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215

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att gaa  aag ata aag cat taa aactgggaaa ctataaagta atgatataag        6533
Ile Glu  Lys Ile Lys His
    1995


ggtagcatt gtg  gac tca ttt cct gcc  ata gag ata gat aaa  gtt aaa     6581
          Val  Asp Ser Phe Pro Ala  Ile Glu Ile Asp Lys  Val Lys
          2000                       2005                  2010


gcc tgg gat  ttt cgg cta gct aat  ata aat act tct gaa  tgt tta       6626
Ala Trp Asp  Phe Arg Leu Ala Asn  Ile Asn Thr Ser Glu  Cys Leu
    2015                2020                2025


aat gtt gcc  tat ggt gtc gat gct  aat tat ctt gat ggt  gta ggt       6671
Asn Val Ala  Tyr Gly Val Asp Ala  Asn Tyr Leu Asp Gly  Val Gly
    2030                2035                2040


gtt tcc atc  aca tca att gtc cta  aat aat cga cat att  aat ctt       6716
Val Ser Ile  Thr Ser Ile Val Leu  Asn Asn Arg His Ile  Asn Leu
    2045                2050                2055


gat ttt tat  att att gct gat gtt  tat aat gat ggt ttt  ttt caa       6761
Asp Phe Tyr  Ile Ile Ala Asp Val  Tyr Asn Asp Gly Phe  Phe Gln
    2060                2065                2070


aaa att gca  aag ctt gca gag caa  aac caa tta aga atc  acg tta       6806
Lys Ile Ala  Lys Leu Ala Glu Gln  Asn Gln Leu Arg Ile  Thr Leu
    2075                2080                2085


tat aga att  aac act gat aag ctc  cag tgc ttg cct tgt  aca cag       6851
Tyr Arg Ile  Asn Thr Asp Lys Leu  Gln Cys Leu Pro Cys  Thr Gln
    2090                2095                2100


gtc tgg tca  aga gca atg tac ttc  cgt tta ttt gca ttt  caa tta       6896
Val Trp Ser  Arg Ala Met Tyr Phe  Arg Leu Phe Ala Phe  Gln Leu
    2105                2110                2115


ttg ggt tta  acg ctt gat cgt ttg  ctt tat ctt gat gca  gat gtt       6941
Leu Gly Leu  Thr Leu Asp Arg Leu  Leu Tyr Leu Asp Ala  Asp Val
    2120                2125                2130


gtt tgt aaa  ggc gat att agc caa  cta tta cat ctg ggt  tta aat       6986
Val Cys Lys  Gly Asp Ile Ser Gln  Leu Leu His Leu Gly  Leu Asn
     2135               2140                2145


gga gcg gtt  gct gct gtt gtt aaa  gat gtt gag cca atg  caa gaa       7031
Gly Ala Val  Ala Ala Val Val Lys  Asp Val Glu Pro Met  Gln Glu
    2150                2155                2160


aag gcg gta  tcc agg ttg tct gat  cct gaa tta ctt ggg  cag tac       7076
Lys Ala Val  Ser Arg Leu Ser Asp  Pro Glu Leu Leu Gly  Gln Tyr
    2165                2170                2175


ttt aat tcc  ggt gtc gtt tat tta  gac tta aaa aaa tgg  gct gac       7121
Phe Asn Ser  Gly Val Val Tyr Leu  Asp Leu Lys Lys Trp  Ala Asp
    2180                2185                2190
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216

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gca aaa cta  aca gaa aaa gcg ttg  tct att ctt atg agt  aaa gat    7166
Ala Lys Leu  Thr Glu Lys Ala Leu  Ser Ile Leu Met Ser  Lys Asp
        2195              2200              2205

aat gtt tat  aaa tac cct gat cag  gat gtt atg aat gtc  tta ctg    7211
Asn Val Tyr  Lys Tyr Pro Asp Gln  Asp Val Met Asn Val  Leu Leu
        2210              2215              2220

aaa ggg atg  aca tta ttt ttg cct  cgt gag tac aat aca  att tat    7256
Lys Gly Met  Thr Leu Phe Leu Pro  Arg Glu Tyr Asn Thr  Ile Tyr
        2225              2230              2235

aca att aaa  agt gaa tta aaa gac  aaa aca cat caa aac  tat aaa    7301
Thr Ile Lys  Ser Glu Leu Lys Asp  Lys Thr His Gln Asn  Tyr Lys
        2240              2245              2250

aag ctg att  aca gaa agt act ctt  ctt att cat tat aca  ggt gca    7346
Lys Leu Ile  Thr Glu Ser Thr Leu  Leu Ile His Tyr Thr  Gly Ala
        2255              2260              2265

act aaa ccg  tgg cac aaa tgg gca  att tat cca tcg gta  aaa tac    7391
Thr Lys Pro  Trp His Lys Trp Ala  Ile Tyr Pro Ser Val  Lys Tyr
        2270              2275              2280

tat aaa ata  gct tta gaa aat tcc  ccc tgg aaa gat gac  tct cca    7436
Tyr Lys Ile  Ala Leu Glu Asn Ser  Pro Trp Lys Asp Asp  Ser Pro
        2285              2290              2295

cga gat gcg  aaa tca att att gaa  ttt aaa aaa gat ata  aac atc    7481
Arg Asp Ala  Lys Ser Ile Ile Glu  Phe Lys Lys Asp Ile  Asn Ile
        2300              2305              2310

ttt tag tgcaacatca tt                                              7499
Phe
```

```
<210>  106
<211>  344
<212>  PRT
<213>  Escherichia coli

<400>  106
```

```
Met Arg Tyr His Gly Asp Met Leu Leu Thr Thr Pro Val Ile Ser Thr
1               5                   10                  15


Leu Lys Gln Asn Tyr Pro Asp Ala Lys Ile Asp Met Leu Leu Tyr Gln
            20                  25                  30


Asp Thr Ile Pro Ile Leu Ser Glu Asn Pro Glu Ile Asn Ala Leu Tyr
        35                  40                  45
```

217

Gly Ile Ser Asn Lys Gly Ala Gly Thr Phe Asp Lys Ile Lys Asn Val
   50   55   60

Leu Ser Leu Ile Lys Thr Leu Arg Ala Asn Asn Tyr Asp Leu Val Ile
65   70   75   80

Asn Leu Thr Asp Gln Trp Met Val Ala Leu Leu Val Arg Cys Leu Pro
           85   90   95

Ala Arg Met Lys Ile Ser Gln Leu Tyr Gly His Arg Gln His Gly Ile
          100   105   110

Trp Lys Lys Ser Phe Thr His Leu Ala Pro Ile His Gly Thr His Ile
     115   120   125

Val Glu Arg Asn Leu Ser Val Leu Glu Pro Leu Gly Ile Thr Asp Phe
   130   135   140

Tyr Thr Asp Thr Thr Met Ser Tyr Ala Glu Asp Cys Trp Lys Lys Met
145   150   155   160

Arg Arg Glu Leu Asp Ala Leu Gly Val Lys Asp His Tyr Val Val Ile
          165   170   175

Gln Pro Thr Ala Arg Gln Ile Phe Lys Cys Trp Asp Asn Asp Lys Phe
          180   185   190

Ser Lys Val Ile Asp Ala Leu Gln Gln Arg Gly Tyr Gln Val Val Leu
     195   200   205

Thr Cys Gly Pro Ser Ala Asp Asp Leu Ala Cys Val Asp Glu Ile Ala
   210   215   220

Arg Gly Cys Glu Thr Lys Pro Ile Thr Gly Leu Ala Gly Lys Thr Arg
225   230   235   240

Phe Pro Glu Leu Gly Ala Leu Ile Asp His Ala Val Leu Phe Ile Gly
          245   250   255

Val Asp Ser Ala Pro Gly His Ile Ala Ala Ala Val Lys Thr Pro Val
          260   265   270

218

```
Ile Ser Leu Phe Gly Ala Thr Asp His Val Phe Trp Arg Pro Trp Thr
        275                 280                 285

Glu Asn Ile Ile Gln Phe Trp Ala Gly Asn Tyr Gln Lys Met Pro Thr
        290                 295                 300

Arg His Glu Leu Asp Arg Asn Lys Lys Tyr Leu Ser Val Ile Pro Ala
        305                 310                 315                 320

Glu Asp Val Ile Ala Ala Thr Glu Lys Leu Leu Pro Glu Asp Ala Pro
                325                 330                 335

Ser Ala Asp Arg Asn Ala Gln Leu
                340
```

<210> 107
<211> 371
<212> PRT
<213> Escherichia coli

<400> 107

```
Ile Val Ala Phe Cys Leu Tyr Lys Tyr Phe Pro Phe Gly Gly Leu Gln
1               5                   10                  15

Arg Asp Phe Met Arg Ile Ala Ser Thr Val Ala Ala Arg Gly His His
            20                  25                  30

Val Arg Val Tyr Thr Gln Ser Trp Glu Gly Asp Cys Pro Lys Ala Phe
        35                  40                  45

Glu Leu Ile Gln Val Pro Val Lys Ser His Thr Asn His Gly Arg Asn
    50                  55                  60

Ala Glu Tyr Tyr Ala Trp Val Gln Asn His Leu Lys Glu His Pro Ala
65                  70                  75                  80

Asp Arg Val Val Gly Phe Asn Lys Met Pro Gly Leu Asp Val Tyr Phe
                85                  90                  95

Ala Ala Asp Val Cys Tyr Ala Glu Lys Val Ala Gln Glu Lys Gly Phe
            100                 105                 110
```

219

```
Leu Tyr Arg Leu Thr Ser Arg Tyr Arg His Tyr Ala Ala Phe Glu Arg
        115              120           125

Ala Thr Phe Glu Gln Gly Lys Ser Thr Lys Leu Met Met Leu Thr Asp
    130               135               140

Lys Gln Ile Ala Asp Phe Gln Lys His Tyr Gln Thr Glu Pro Glu Arg
145           150               155                   160

Phe Gln Ile Leu Pro Pro Gly Ile Tyr Pro Asp Arg Lys Tyr Ser Glu
                165               170               175

Gln Ile Pro Asn Ser Arg Glu Ile Tyr Arg Gln Lys Asn Gly Ile Lys
                180               185               190

Glu Gln Gln Asn Leu Leu Leu Gln Val Gly Ser Asp Phe Gly Arg Lys
        195               200               205

Gly Val Asp Arg Ser Ile Glu Ala Leu Ala Ser Leu Pro Glu Ser Leu
    210               215               220

Arg His Asn Thr Leu Leu Phe Val Val Gly Gln Asp Lys Pro Arg Lys
225               230               235               240

Phe Glu Ala Leu Ala Glu Lys Leu Gly Val Arg Ser Asn Val His Phe
                245               250               255

Phe Ser Gly Arg Asn Asp Val Ser Glu Leu Met Ala Ala Ala Asp Leu
                260               265               270

Leu Leu His Pro Ala Tyr Gln Glu Ala Ala Gly Ile Val Leu Leu Glu
            275               280               285

Ala Ile Thr Ala Gly Leu Pro Val Leu Thr Thr Ala Val Cys Gly Tyr
    290               295               300

Ala His Tyr Ile Ala Asp Ala Asn Cys Gly Thr Val Ile Ala Glu Pro
305               310               315               320

Phe Ser Gln Glu Gln Leu Asn Glu Val Leu Arg Lys Ala Leu Thr Gln
                325               330               335
```

220

Ser Pro Leu Arg Met Ala Trp Ala Glu Asn Ala Arg His Tyr Ala Asp
        340   345   350

Thr Gln Asp Leu Tyr Ser Leu Pro Glu Lys Ala Ala Asp Ile Ile Thr
        355   360   365

Gly Gly Leu
    370

<210> 108
<211> 265
<212> PRT
<213> Escherichia coli

<400> 108

Met Val Glu Leu Lys Glu Pro Leu Ala Thr Leu Trp Arg Gly Lys Asp
1   5   10   15

Ala Phe Ala Glu Val Lys Lys Leu Asn Gly Glu Val Phe Arg Glu Leu
        20   25   30

Glu Thr Arg Arg Thr Leu Arg Phe Glu Leu Ser Gly Lys Ser Tyr Phe
        35   40   45

Leu Lys Trp His Lys Gly Thr Thr Leu Lys Glu Ile Ile Lys Asn Leu
    50   55   60

Leu Ser Leu Arg Met Pro Val Leu Gly Ala Asp Arg Glu Trp His Ala
65   70   75   80

Ile His Arg Leu Ser Asp Val Gly Val Asp Thr Met Lys Gly Ile Gly
                85   90   95

Phe Gly Glu Lys Gly Leu Asn Pro Leu Thr Arg Ala Ser Phe Ile Ile
            100   105   110

Thr Glu Asp Leu Thr Pro Thr Ile Ser Leu Glu Asp Tyr Cys Ala Asp
        115   120   125

Trp Ala Val Asn Pro Pro Asp Ile Arg Val Lys Arg Met Leu Ile Ala
    130   135   140

221

Arg Val Ala Thr Met Val Arg Lys Met His Thr Ala Gly Ile Asn His
145   150   155   160

Arg Asp Cys Tyr Ile Cys His Phe Leu Leu His Leu Pro Phe Thr Gly
                165   170   175

Arg Glu Asp Glu Leu Lys Ile Ser Val Ile Asp Leu His Arg Ala Gln
                180   185   190

Ile Arg Ala Lys Val Pro Arg Arg Trp Arg Asp Lys Asp Leu Ile Gly
            195   200   205

Leu Tyr Phe Ser Ser Met Asn Ile Gly Leu Thr Gln Arg Asp Ile Trp
    210   215   220

Arg Phe Met Lys Val Tyr Phe Gly Met Pro Leu Arg Lys Ile Leu Ser
225   230   235   240

Leu Glu Gln Asn Leu Leu Asn Met Ala Ser Val Lys Ala Glu Arg Ile
            245   250   255

Lys Glu Arg Thr Gln Arg Lys Gly Leu
            260   265

<210>   109
<211>   311
<212>   PRT
<213>   Escherichia coli

<400>   109

Met Thr Ile Tyr Phe Ile Asn Trp Val Ala Asp Tyr Glu Leu Lys Met
1   5   10   15

Ile Gln Tyr Leu Lys Lys Lys Tyr Lys Ile Lys Asn Ile Thr Thr Pro
            20   25   30

Lys Lys Tyr Asn Trp Ile Asn Lys Lys Ile Ser Lys Ile Gly Met Asp
        35   40   45

Asn Ala Trp Leu Gly Arg Leu Phe Ile Lys His Tyr Leu Asn Asp Ile
    50   55   60

222

Lys Lys Asp Asp Ile Ile Ile Ile Asn Asp Ser Val Val Asn Lys Gly
65   70   75   80

Ile Asn Lys Gln Ile Leu Lys Asn Ile Asn Cys His Lys Val Leu Leu
            85   90   95

Leu Arg Asn Thr Val Gly Glu Asp Phe Ile Leu Asp Asn Ala Asn Tyr
            100   105   110

Phe Asp Ile Ile Tyr Asp Phe Glu His Arg Phe Ile Gly Asn Glu Lys
            115   120   125

Ile Lys Ala Ile Glu Gln Phe Phe Pro Ile Gly Met Asp Glu Ile Arg
            130   135   140

Asn Tyr Ser Leu Ser Asp Lys Asn Asn Ser Gln Pro Ile Cys Phe Phe
145   150   155   160

Leu Gly Arg Asp Lys Gly Arg Leu Gln Ile Ile Asn Glu Leu Ala Glu
            165   170   175

Arg Leu Thr Thr Leu Gly Cys Lys Leu Asp Phe Asn Val Val Lys Asp
            180   185   190

Lys Thr Ser Ser Thr Thr Ser Lys Tyr Leu Ile Glu Lys Gln Ile Ser
            195   200   205

Tyr Glu Glu Asn Ile Arg Arg Thr Leu Asn Ala Asn Ile Ile Val Asp
    210   215   220

Ile Thr Lys Glu Asn Gln Ser Gly Trp Thr Leu Arg Ile Leu Glu Ala
225   230   235   240

Leu Phe Phe Asn Lys Lys Leu Ile Thr Asn Asn Ile Asn Val Phe Gly
            245   250   255

Ser Glu Ile Tyr Ser Glu Ser Arg Phe Phe Ile Ile Gly His Asp Asp
            260   265   270

Trp Asp Lys Leu Glu Tyr Phe Ile Asn Ser Ser Val Lys Pro Met Asp
            275   280   285

223

Tyr Asp Ser Leu Tyr Lys Phe Ser Pro Asp Lys Met Met Ser Thr Ile
    290   295   300

Val Ser Asp Phe Ile Asp Lys
305   310

<210> 110
<211> 369
<212> PRT
<213> Escherichia coli

<400> 110

Val Ser Phe Thr Gln Leu Met Arg Val Ser Met Lys Ile Ala Phe Ile
1   5   10   15

Gly Glu Ala Val Ser Gly Phe Gly Gly Met Glu Thr Val Ile Arg Asp
            20   25   30

Val Ile Thr Thr Phe Arg Gln Gln His Ile Gln Ser Glu Met Phe Phe
        35   40   45

Phe Cys Arg Asn Asp Lys Met Asp Lys Gly Trp Leu Glu Gly Ile Lys
    50   55   60

Tyr Ser Cys Ser Phe Ser Asn Ile Arg Leu Gly Phe Leu Arg Arg Ala
65   70   75   80

Lys His Ile His Ala Leu Ser Lys Trp Leu Gln Glu Tyr Gln Pro Asp
            85   90   95

Ile Val Ile Cys Ile Asp Val Ile Ser Cys Leu Phe Ala Ala Lys Ala
            100   105   110

Arg Lys Lys Ser Gly Ile Asp Met Pro Val Phe Ser Trp Pro His Phe
        115   120   125

Ser Leu Asp His Lys Lys His Ala Glu Tyr Ile Thr Cys Ala Asp Tyr
    130   135   140

His Leu Ala Ile Ser Ser Gly Ile Lys Gln Gln Met Ile Asn Arg Gly
145   150   155   160

224

Val Ala Glu Ser Thr Ile Asn Val Ile Phe Asn Pro Val Glu Thr Lys
             165   170   175

Asp Ser Val Ile Pro Ala Pro Glu Glu Gly Glu Thr Ala Thr Phe Ile
           180   185   190

Tyr Val Gly Arg Met Lys Phe Glu Gly Gln Lys Arg Val Lys Asp Leu
           195   200   205

Leu Asp Gly Leu Ser Gln Ala Lys Gly Asn Trp Lys Leu His Val Leu
    210   215   220

Gly Asp Gly Ser Asp Phe Glu Lys Cys Gln Ala Tyr Gly Arg Glu Leu
225   230   235   240

Asn Ile Asp Asp Arg Ile Val Trp Tyr Gly Trp Gln Gln Tyr Pro Trp
           245   250   255

Glu Leu Val Gln Gln Asp Ile Glu Lys Val Ser Ala Leu Leu Leu Thr
           260   265   270

Ser Ser Phe Glu Gly Phe Pro Met Thr Leu Leu Glu Ala Leu Ser Trp
           275   280   285

Gly Ile Pro Cys Ile Ser Ala Asp Cys Val Ser Gly Pro Ala Asp Ile
           290   295   300

Ile Gln Pro Asp Val Asn Gly His Leu Tyr Gln Pro Gly Asp Ile Ala
305   310   315   320

Gly Phe Val Thr Leu Leu Asn Lys Tyr Ile Ala Gly Glu Ile His Ile
           325   330   335

Glu His Glu Lys Ile Pro Ala Ser Ile Asp Glu Phe Tyr Gln Ser Lys
           340   345   350

Tyr Tyr Asp Arg Leu His Lys Val Ile Ile Ser Ala Ile Ser Arg Arg
           355   360   365

Lys

<210> 111
<211> 339
<212> PRT
<213> Escherichia coli

<400> 111

Met Gln Gln Val Phe Phe Gln Glu Thr Glu Phe Leu Asn Ser Val Ile
1   5   10   15

Asp Tyr Asp His Lys Val Glu Thr Glu Asn Leu Cys Leu Asp Ile Ala
            20   25   30

Tyr Gly Thr Asp Lys Asn Phe Leu Phe Gly Cys Gly Ile Ser Ile Ala
        35   40   45

Ser Ile Leu Lys Tyr Asn Glu Gly Ser Arg Leu Cys Phe His Ile Phe
    50   55   60

Thr Asp Tyr Phe Gly Asp Asp Asp Arg Lys Tyr Phe Asp Ala Leu Ala
65   70   75   80

Leu Gln Tyr Lys Thr Arg Ile Lys Ile Tyr Leu Ile Asn Gly Asp Arg
                85   90   95

Leu Arg Ser Leu Pro Ser Thr Lys Asn Trp Thr His Ala Ile Tyr Phe
            100   105   110

Arg Phe Val Ile Ala Asp Tyr Phe Ile Asn Lys Ala Pro Lys Val Leu
        115   120   125

Tyr Leu Asp Ala Asp Ile Ile Cys Gln Gly Thr Ile Glu Pro Leu Ile
    130   135   140

Asn Phe Ser Phe Pro Asp Asp Lys Val Ala Met Val Val Thr Glu Gly
145   150   155   160

Gln Ala Asp Trp Trp Glu Lys Arg Ala His Ser Leu Gly Val Ala Gly
            165   170   175

Ile Ala Lys Gly Tyr Phe Asn Ser Gly Phe Leu Leu Ile Asn Thr Ala
        180   185   190

226

```
Gln Trp Ala Ala Gln Gln Val Ser Ala Arg Ala Ile Ala Met Leu Asn
        195             200             205

Glu Pro Glu Ile Ile Lys Lys Ile Thr His Pro Asp Gln Asp Val Leu
    210             215             220

Asn Met Leu Leu Ala Asp Lys Leu Ile Phe Ala Asp Ile Lys Tyr Asn
225             230             235             240

Thr Gln Phe Ser Leu Asn Tyr Gln Leu Lys Glu Ser Phe Ile Asn Pro
            245             250             255

Val Thr Asn Asp Thr Ile Phe Ile His Tyr Ile Gly Pro Thr Lys Pro
            260             265             270

Trp His Asp Trp Ala Trp Asp Tyr Pro Val Ser Gln Ala Phe Met Glu
        275             280             285

Ala Lys Asn Ala Ser Pro Trp Lys Asn Thr Ala Leu Leu Lys Pro Asn
    290             295             300

Asn Ser Asn Gln Leu Arg Tyr Ser Ala Lys His Met Leu Lys Lys His
305             310             315             320

Arg Tyr Leu Lys Gly Phe Ser Asn Tyr Leu Phe Tyr Phe Ile Glu Lys
            325             330             335

Ile Lys His
```

```
<210>   112
<211>   314
<212>   PRT
<213>   Escherichia coli

<400>   112
```

```
Val Asp Ser Phe Pro Ala Ile Glu Ile Asp Lys Val Lys Ala Trp Asp
1               5               10              15

Phe Arg Leu Ala Asn Ile Asn Thr Ser Glu Cys Leu Asn Val Ala Tyr
            20              25              30
```

```
Gly Val Asp Ala Asn Tyr Leu Asp Gly Val Gly Val Ser Ile Thr Ser
        35              40              45
```

```
Ile Val Leu Asn Asn Arg His Ile Asn Leu Asp Phe Tyr Ile Ile Ala
        50              55              60
```

```
Asp Val Tyr Asn Asp Gly Phe Phe Gln Lys Ile Ala Lys Leu Ala Glu
65              70              75              80
```

```
Gln Asn Gln Leu Arg Ile Thr Leu Tyr Arg Ile Asn Thr Asp Lys Leu
            85              90              95
```

```
Gln Cys Leu Pro Cys Thr Gln Val Trp Ser Arg Ala Met Tyr Phe Arg
            100             105             110
```

```
Leu Phe Ala Phe Gln Leu Leu Gly Leu Thr Leu Asp Arg Leu Leu Tyr
        115             120             125
```

```
Leu Asp Ala Asp Val Val Cys Lys Gly Asp Ile Ser Gln Leu Leu His
        130             135             140
```

```
Leu Gly Leu Asn Gly Ala Val Ala Ala Val Val Lys Asp Val Glu Pro
145             150             155             160
```

```
Met Gln Glu Lys Ala Val Ser Arg Leu Ser Asp Pro Glu Leu Leu Gly
            165             170             175
```

```
Gln Tyr Phe Asn Ser Gly Val Val Tyr Leu Asp Leu Lys Lys Trp Ala
            180             185             190
```

```
Asp Ala Lys Leu Thr Glu Lys Ala Leu Ser Ile Leu Met Ser Lys Asp
        195             200             205
```

```
Asn Val Tyr Lys Tyr Pro Asp Gln Asp Val Met Asn Val Leu Leu Lys
        210             215             220
```

```
Gly Met Thr Leu Phe Leu Pro Arg Glu Tyr Asn Thr Ile Tyr Thr Ile
225             230             235             240
```

```
Lys Ser Glu Leu Lys Asp Lys Thr His Gln Asn Tyr Lys Lys Leu Ile
            245             250             255
```

228

```
Thr Glu Ser Thr Leu Leu Ile His Tyr Thr Gly Ala Thr Lys Pro Trp
        260             265             270


His Lys Trp Ala Ile Tyr Pro Ser Val Lys Tyr Tyr Lys Ile Ala Leu
        275             280             285


Glu Asn Ser Pro Trp Lys Asp Asp Ser Pro Arg Asp Ala Lys Ser Ile
    290             295             300


Ile Glu Phe Lys Lys Asp Ile Asn Ile Phe
305             310
```

<210> 113
<211> 8391
<212> DNA
<213> Mycobacterium bovis

<220>
<221> CDS
<222> (1)..(8391)
<223>

<400> 113

```
atg ggt acg cgc act ggc ggc cga gga ccc ggt tcc gtc cga caa gca      48
Met Gly Thr Arg Thr Gly Gly Arg Gly Pro Gly Ser Val Arg Gln Ala
1               5               10              15


cct gac gtc ggc cgc cgt gtc ggt gcc cgg cgt gtt gct tac cca gat      96
Pro Asp Val Gly Arg Arg Val Gly Ala Arg Arg Val Ala Tyr Pro Asp
                20              25              30


cgc ggc gac ccg ggc gct ggc ccg tca agg cat gga cct cgt ggc cac     144
Arg Gly Asp Pro Gly Ala Gly Pro Ser Arg His Gly Pro Arg Gly His
            35              40              45


ccc gcc ggt cgc cat ggc ggg cat tcg caa ggt gtg ctg gcg gtg gaa     192
Pro Ala Gly Arg His Gly Gly His Ser Gln Gly Val Leu Ala Val Glu
    50              55              60


gcc ctc aag gct ggt ggg gca cgc gac gtc gag ctg ttt gcc ttg gcc     240
Ala Leu Lys Ala Gly Gly Ala Arg Asp Val Glu Leu Phe Ala Leu Ala
65              70              75              80


cag ttg atc ggt gcc gcc gga acg ctg gtg gcc cgc cgg cgc gaa ttt     288
Gln Leu Ile Gly Ala Ala Gly Thr Leu Val Ala Arg Arg Arg Glu Phe
                85              90              95


ccg tcc tgg gcg atc gcg ccg atg gta tcg gtc acc aac gcc gac ccc     336
Pro Ser Trp Ala Ile Ala Pro Met Val Ser Val Thr Asn Ala Asp Pro
                100             105             110
```

229

```
gag cgc atc ggc cgg ttg ctc gac gag ttc gcc cag gac gtg cgc acg      384
Glu Arg Ile Gly Arg Leu Leu Asp Glu Phe Ala Gln Asp Val Arg Thr
        115                 120             125

gtg ctg cca ccg gtg ttg tcc atc cgc aac ggc cgg cgt gcc gtc gtc      432
Val Leu Pro Pro Val Leu Ser Ile Arg Asn Gly Arg Arg Ala Val Val
        130                 135             140

atc acc ggc acc ccc gag cag ctg tcg cgt ttc gag ctt tat tgc cgc      480
Ile Thr Gly Thr Pro Glu Gln Leu Ser Arg Phe Glu Leu Tyr Cys Arg
145                 150                 155                 160

cag atc tcc gag aag gaa gaa gcc gac cgc aag aac aag gtc cgc ggc      528
Gln Ile Ser Glu Lys Glu Glu Ala Asp Arg Lys Asn Lys Val Arg Gly
                165                 170                 175

ggc gac gtc ttc tcg ccg gtc ttc gag ccg gtg cag gtg gag gtg ggc      576
Gly Asp Val Phe Ser Pro Val Phe Glu Pro Val Gln Val Glu Val Gly
                180                 185                 190

ttt cac acc ccg cgg cta tcc gac ggg atc gac atc gtc gcg ggc tgg      624
Phe His Thr Pro Arg Leu Ser Asp Gly Ile Asp Ile Val Ala Gly Trp
        195                 200                 205

gcc gag aag gcg ggc ctc gat gtc gcc ttg gct cgg gag ctg gcc gat      672
Ala Glu Lys Ala Gly Leu Asp Val Ala Leu Ala Arg Glu Leu Ala Asp
        210                 215                 220

gcc atc ttg atc aga aag gtc gac tgg gtc gac gag atc acc cgt gtc      720
Ala Ile Leu Ile Arg Lys Val Asp Trp Val Asp Glu Ile Thr Arg Val
225                 230                 235                 240

cac cgg gcc ggc gcc cgc tgg atc ctc gac ctg ggg ccg ggc gac atc      768
His Arg Ala Gly Ala Arg Trp Ile Leu Asp Leu Gly Pro Gly Asp Ile
                245                 250                 255

ctg acc cga ctg acc gca ccg gtg atc cgc ggc ctg ggc atc ggc atc      816
Leu Thr Arg Leu Thr Ala Pro Val Ile Arg Gly Leu Gly Ile Gly Ile
                260                 265                 270

gtg ccg gcg cgt acc cgc ggt ggc cag cgc aac ctg ttc acc gtc ggc      864
Val Pro Ala Arg Thr Arg Gly Gly Gln Arg Asn Leu Phe Thr Val Gly
        275                 280                 285

gcc acc ccc gag gtt gcc cgg gcc tgg tcg agc tac gca ccg acc gtg      912
Ala Thr Pro Glu Val Ala Arg Ala Trp Ser Ser Tyr Ala Pro Thr Val
        290                 295                 300

gtt cgc ctc ccc gac ggc agg gtc aag ctc tcg acg aag ttc acc cgg      960
Val Arg Leu Pro Asp Gly Arg Val Lys Leu Ser Thr Lys Phe Thr Arg
305                 310                 315                 320

ctg acc cgc cgc tcg ccg atc ctg ctc gcg ggc atg acc ccg acc acc     1008
Leu Thr Arg Arg Ser Pro Ile Leu Leu Ala Gly Met Thr Pro Thr Thr
                325                 330                 335
```

230

```
gtg gac gcc aag atc gtc gcc gcg gcg gcc aac ggc cgg cac tgg gcc      1056
Val Asp Ala Lys Ile Val Ala Ala Ala Ala Asn Gly Arg His Trp Ala
            340             345             350

gag ctg gcg gcg cgg ggc agg tca ccg aag aga tct tcg gta acc gca      1104
Glu Leu Ala Ala Arg Gly Arg Ser Pro Lys Arg Ser Ser Val Thr Ala
            355             360             365

tcg aac aaa tgg ccg gcc tgc tcg agc cgg gcc gca cct atc agt tca      1152
Ser Asn Lys Trp Pro Ala Cys Ser Ser Arg Ala Ala Pro Ile Ser Ser
            370             375             380

acg cgc tgt tcc tcg atc cct acc tgt gaa gct tca ggt ggg cgg caa      1200
Thr Arg Cys Ser Ser Ile Pro Thr Cys Glu Ala Ser Gly Gly Arg Gln
385             390             395             400

gcg gtt ggt gca gaa ggc ccg cca gtc cgg cgc cgc gat cga cgg cgt      1248
Ala Val Gly Ala Glu Gly Pro Pro Val Arg Arg Arg Asp Arg Arg Arg
            405             410             415

ggt gat cag cgc cgg cat ccc aga cct cga cga ggc cgt cga gct gat      1296
Gly Asp Gln Arg Arg His Pro Arg Pro Arg Arg Gly Arg Arg Ala Asp
            420             425             430

cga cga act ggg cga cat cgg cat cag cca cgt cgt gtt caa acc cgg      1344
Arg Arg Thr Gly Arg His Arg His Gln Pro Arg Arg Val Gln Thr Arg
            435             440             445

gac cat cga gca gat ccg ctc ggt gat tcg cat cgc cac cga ggt gcc      1392
Asp His Arg Ala Asp Pro Leu Gly Asp Ser His Arg His Arg Gly Ala
            450             455             460

cac caa gcc ggt gat cat gca cgt cga ggg ccg ggc gcg ccg gcg ggc      1440
His Gln Ala Gly Asp His Ala Arg Arg Gly Pro Gly Ala Pro Ala Gly
465             470             475             480

acc att cct ggg agg atc tca cac ctg ctg ctg gct acc tac tcg gca      1488
Thr Ile Pro Gly Arg Ile Ser His Leu Leu Leu Ala Thr Tyr Ser Ala
            485             490             495

gat cgg gca ccg cgc caa cat cac gtg tgc gtc ggc ggc ggc cat ctc      1536
Asp Arg Ala Pro Arg Gln His His Val Cys Val Gly Gly Gly His Leu
            500             505             510

ggc acc ccg aag aag ggc tgc gga tat ttg tcc ggg cct ggg cgc agc      1584
Gly Thr Pro Lys Lys Gly Cys Gly Tyr Leu Ser Gly Pro Gly Arg Ser
            515             520             525

gta cgg ctt ccc att gat gcc gat cga cgc atc ctg gtc ggc acc gcg      1632
Val Arg Leu Pro Ile Asp Ala Asp Arg Arg Ile Leu Val Gly Thr Ala
            530             535             540

gcg atg gcc acc aag gaa tcc acc acg tcg cca tcg gtc aag cgg atg      1680
Ala Met Ala Thr Lys Glu Ser Thr Thr Ser Pro Ser Val Lys Arg Met
545             550             555             560
```

231

```
ctc gtc gac act cag ggc acc gac caa tgg atc agc gcc gga aaa gcg        1728
Leu Val Asp Thr Gln Gly Thr Asp Gln Trp Ile Ser Ala Gly Lys Ala
            565                 570                 575

cag ggc cgc atg cct cca gcc gag tca gct cgg tgc cga cat cca cga        1776
Gln Gly Arg Met Pro Pro Ala Glu Ser Ala Arg Cys Arg His Pro Arg
            580                 585                 590

gat cga cac agc gca tcc gtg cgg cgc tgc tcg acg agg tgg ccg gtg        1824
Asp Arg His Ser Ala Ser Val Arg Arg Cys Ser Thr Arg Trp Pro Val
            595                 600                 605

acg cgg agg cgg tcg cgg agc gtc gca tgg cca aga ccg cca agc cct        1872
Thr Arg Arg Arg Ser Arg Ser Val Ala Trp Pro Arg Pro Pro Ser Pro
    610                 615                 620

act tgc cga cgt cgc cga cat gac cta cct gca gtg gct gcg ggc gct        1920
Thr Cys Arg Arg Arg Arg His Asp Leu Pro Ala Val Ala Ala Gly Ala
625                 630                 635                 640

acg tcg aac tgg cca tcg ggg aag gca act cga ccg ccg aca ccg cct        1968
Thr Ser Asn Trp Pro Ser Gly Lys Ala Thr Arg Pro Pro Thr Pro Pro
                645                 650                 655

cgg tgg gca gcc cgt ggc tgg ccg aca ctg gcg gga ccg ctt cga gca        2016
Arg Trp Ala Ala Arg Gly Trp Pro Thr Leu Ala Gly Pro Leu Arg Ala
            660                 665                 670

gat gct gca gcg tgc cga agc ccg gtt gca ccc aca gga ttt cgg ccc        2064
Asp Ala Ala Ala Cys Arg Ser Pro Val Ala Pro Thr Gly Phe Arg Pro
            675                 680                 685

gat cca gac gct att cac cga tgc tgg cct gct gga caa tcc gca gca        2112
Asp Pro Asp Ala Ile His Arg Cys Trp Pro Ala Gly Gln Ser Ala Ala
            690                 695                 700

gcg atc gcc gcc ctc gtg gcg cgc tac ccc gac gcc gag acc gtg cag        2160
Ala Ile Ala Ala Leu Val Ala Arg Tyr Pro Asp Ala Glu Thr Val Gln
705                 710                 715                 720

ttg cat ccc gcg gat gtg ccc ttt ttc gtg acg ttg tgc aag acg ctg        2208
Leu His Pro Ala Asp Val Pro Phe Phe Val Thr Leu Cys Lys Thr Leu
                725                 730                 735

ggc aag ccg gtc aac ttc gtg ccg gcg atc gac ctc gtc gtg cgc gct        2256
Gly Lys Pro Val Asn Phe Val Pro Ala Ile Asp Leu Val Val Arg Ala
            740                 745                 750

ggt ggc gca gcg act cgc tgt ggc agg ccc acg acg ccc gct acg acg        2304
Gly Gly Ala Ala Thr Arg Cys Gly Arg Pro Thr Thr Pro Ala Thr Thr
            755                 760                 765

ccg atg cgg tgt gca tca ttc cgg gca cgc gtc ggt agc cgc atc acc        2352
Pro Met Arg Cys Ala Ser Phe Arg Ala Arg Val Gly Ser Arg Ile Thr
    770                 775                 780
```

232

```
cgg atg gat gaa ccc gtc ggt gag ttg ctg gac gct ttc gag caa gcc      2400
Arg Met Asp Glu Pro Val Gly Glu Leu Leu Asp Ala Phe Glu Gln Ala
785             790             795             800

gca atc gat gaa gtg ctc ggc gcc ggt gtc gag ccg aag gat gtc gcg      2448
Ala Ile Asp Glu Val Leu Gly Ala Gly Val Glu Pro Lys Asp Val Ala
            805             810             815

tcc ggc cgg ctg ggc cgg gcc gac gtg gcc gga ccg ttg gct gtc gtc      2496
Ser Gly Arg Leu Gly Arg Ala Asp Val Ala Gly Pro Leu Ala Val Val
        820             825             830

ctc gac gca ccc gat gtg cgc tgg gcc ggt cgc acc gtg acc aac ccg      2544
Leu Asp Ala Pro Asp Val Arg Trp Ala Gly Arg Thr Val Thr Asn Pro
        835             840             845

gtg cat cgg atc cgc gac ccg gcc gaa tgg cag gtg cac gat gga ccc      2592
Val His Arg Ile Arg Asp Pro Ala Glu Trp Gln Val His Asp Gly Pro
850             855             860

gaa aac ccg cgc gcc gca cac tca tcc acc ggc gcc cgg ctg cag acg      2640
Glu Asn Pro Arg Ala Ala His Ser Ser Thr Gly Ala Arg Leu Gln Thr
865             870             875             880

cac ggc gac gac gtc gcc ttg agc gtc gcg cgt ctc ggg cac ctg ggt      2688
His Gly Asp Asp Val Ala Leu Ser Val Ala Arg Leu Gly His Leu Gly
            885             890             895

cga cat ccg att cac gtt gcc ggc caa cac cgt cga tgg cgg cac ccc      2736
Arg His Pro Ile His Val Ala Gly Gln His Arg Arg Trp Arg His Pro
            900             905             910

ggt gat cgc cac cga gga cgc cac cac gcc atg cgc acg gtg ctg cga      2784
Gly Asp Arg His Arg Gly Arg His His Ala Met Arg Thr Val Leu Arg
        915             920             925

tcg ccg ccg gtg tcg aca gcc cgg agt tct tgc tgc ggt ggc caa cgg      2832
Ser Pro Pro Val Ser Thr Ala Arg Ser Ser Cys Cys Gly Gly Gln Arg
930             935             940

gac ggc cac ttt gac ggt gga ctg gca ccc cga gcg tgt tgc cga cca      2880
Asp Gly His Phe Asp Gly Gly Leu Ala Pro Arg Ala Cys Cys Arg Pro
945             950             955             960

cac cgt cac cgc cac gtt cgg tgc gcg ctg gca ccc agc ctc acc aac      2928
His Arg His Arg His Val Arg Cys Ala Leu Ala Pro Ser Leu Thr Asn
            965             970             975

gtg ccg acg cga ctc gtc ggc cct tgt tgg cca gcg gtt ttc gcg gcc      2976
Val Pro Thr Arg Leu Val Gly Pro Cys Trp Pro Ala Val Phe Ala Ala
            980             985             990

atc gga tcg gcg gtc acc gac acc ggt gag ccg gtg gtg gaa ggc ctg      3024
Ile Gly Ser Ala Val Thr Asp Thr Gly Glu Pro Val Val Glu Gly Leu
995             1000            1005
```

233

```
ctg agc ctg gtg cat ctg gac  acg cgg ccg cgc gtg  gtc ggt cag      3069
Leu Ser Leu Val His Leu Asp  Thr Arg Pro Arg Val  Val Gly Gln
    1010            1015              1020

ctg ccc acg gtc ccg gcc caa  ttg acc gtc acg caa  cgg ctg cca      3114
Leu Pro Thr Val Pro Ala Gln  Leu Thr Val Thr Gln  Arg Leu Pro
    1025            1030              1035

acg caa ccg ata cgg aca tgg  gcc gcg tcg tgc cgg  tct cgg tcg      3159
Thr Gln Pro Ile Arg Thr Trp  Ala Ala Ser Cys Arg  Ser Arg Ser
    1040            1045              1050

tcg ttc acc gca tgg cgc cgt  gat cgc cac tct cga  gga gcg att      3204
Ser Phe Thr Ala Trp Arg Arg  Asp Arg His Ser Arg  Gly Ala Ile
    1055            1060              1065

cgc gat cct ggg tcg cac cgg  ttc gcc gag ctg gac  cgg cgc gag      3249
Arg Asp Pro Gly Ser His Arg  Phe Ala Glu Leu Asp  Arg Arg Glu
    1070            1075              1080

ccg gtg gcg cgg tgt cgc gaa  cgc cac cga cac ccc  gcg cgt cgc      3294
Pro Val Ala Arg Cys Arg Glu  Arg His Arg His Pro  Ala Arg Arg
    1085            1090              1095

cgc cgc gac gtc acg atc acc  gcg ccg gtc gac atg  cgc ccg ttc      3339
Arg Arg Asp Val Thr Ile Thr  Ala Pro Val Asp Met  Arg Pro Phe
    1100            1105              1110

gcg gtg gtg tcc ggc gac cac  aac ccc att cac acc  gac cgg gcc      3384
Ala Val Val Ser Gly Asp His  Asn Pro Ile His Thr  Asp Arg Ala
    1115            1120              1125

gcc gct gct tgc cgg cct gga  gtc gcc gat cgt gca  cgg cat gtg      3429
Ala Ala Ala Cys Arg Pro Gly  Val Ala Asp Arg Ala  Arg His Val
    1130            1135              1140

gct gtc ggc cgc ggc gca aca  cgc ggt gac cgg cac  cga cgg gca      3474
Ala Val Gly Arg Gly Ala Thr  Arg Gly Asp Arg His  Arg Arg Ala
    1145            1150              1155

ggc ccg cca ccg gcc cgg ctg  gtc ggc tgg acc gcg  cgg ttt ttg      3519
Gly Pro Pro Pro Ala Arg Leu  Val Gly Trp Thr Ala  Arg Phe Leu
    1160            1165              1170

ggc atg gtg gcc ccg gcg acg  agg tgg act tcc ggt  cga gcg cgt      3564
Gly Met Val Ala Pro Ala Thr  Arg Trp Thr Ser Gly  Arg Ala Arg
    1175            1180              1185

cgg atc gac cag ggc gca gag  att gtg gac gtg gcc  gcg cgc gtc      3609
Arg Ile Asp Gln Gly Ala Glu  Ile Val Asp Val Ala  Ala Arg Val
    1190            1195              1200

ggg tcg gat cta gtg atg tcg  gcc tcc gcg cga ctg  gcc gca ccc      3654
Gly Ser Asp Leu Val Met Ser  Ala Ser Ala Arg Leu  Ala Ala Pro
    1205            1210              1215
```

234

```
aag acg  gtc tac gca ttc ccc  ggc cag ggc atc caa  cac aag ggc    3699
Lys Thr  Val Tyr Ala Phe Pro  Gly Gln Gly Ile Gln  His Lys Gly
    1220             1225              1230

atg ggc  atg gag gtg cgc gcc  gct cca agg cgg ccc  gca agg tgt    3744
Met Gly  Met Glu Val Arg Ala  Ala Pro Arg Arg Pro  Ala Arg Cys
    1235             1240              1245

ggg aca  ccg cgg aca agt tca  ccc gcg aca ccc tgg  gct tct cgg    3789
Gly Thr  Pro Arg Thr Ser Ser  Pro Ala Thr Pro Trp  Ala Ser Arg
    1250             1255              1260

tac tgc  acg tgg tcc gcg aca  acc cga cca gca tca  tcg cca gcg    3834
Tyr Cys  Thr Trp Ser Ala Thr  Thr Arg Pro Ala Ser  Ser Pro Ala
    1265             1270              1275

gtg tgc  act acc acc acc gac  ggg gtg ctc tac ctg  acg cag ttc    3879
Val Cys  Thr Thr Thr Thr Asp  Gly Val Leu Tyr Leu  Thr Gln Phe
    1280             1285              1290

acc cag  gtc gcg atg gcg acg  gtg gcg gcc ggg cag  gtc gcc gag    3924
Thr Gln  Val Ala Met Ala Thr  Val Ala Ala Gly Gln  Val Ala Glu
    1295             1300              1305

atg cgt  gaa cag gga gcc ttc  gtc gaa ggc gcc atc  gcg tgc ggc    3969
Met Arg  Glu Gln Gly Ala Phe  Val Glu Gly Ala Ile  Ala Cys Gly
    1310             1315              1320

cac tcg  gtc ggc gag tac acc  gcg ctg gcc tgc gtg  acc ggc atc    4014
His Ser  Val Gly Glu Tyr Thr  Ala Leu Ala Cys Val  Thr Gly Ile
    1325             1330              1335

tac caa  ctg gaa gcc ttg ctg  gag atg gtg ttt cac  cgc ggg tcg    4059
Tyr Gln  Leu Glu Ala Leu Leu  Glu Met Val Phe His  Arg Gly Ser
    1340             1345              1350

aag atg  cac gac atc gtt ccg  cgc gac gag ctc ggc  cgc tcc aac    4104
Lys Met  His Asp Ile Val Pro  Arg Asp Glu Leu Gly  Arg Ser Asn
    1355             1360              1365

tat cgg  ctg tcg gcc atc cgg  ccg tcc cag atc gac  ctc gac gac    4149
Tyr Arg  Leu Ser Ala Ile Arg  Pro Ser Gln Ile Asp  Leu Asp Asp
    1370             1375              1380

gcc gac  gtg ccc gcg ttc gtc  gcc ggg atc gcg gag  agc acc ggt    4194
Ala Asp  Val Pro Ala Phe Val  Ala Gly Ile Ala Glu  Ser Thr Gly
    1385             1390              1395

gaa ttc  ctg gag atc gag aat  ttc aac ctc ggt ggc  tcg caa tac    4239
Glu Phe  Leu Glu Ile Glu Asn  Phe Asn Leu Gly Gly  Ser Gln Tyr
    1400             1405              1410

gcg atc  gcg ggc acg gta cgc  ggc ctc gag gcg ctc  gag gcc gag    4284
Ala Ile  Ala Gly Thr Val Arg  Gly Leu Glu Ala Leu  Glu Ala Glu
    1415             1420              1425
```

235

```
gtg gag  cgg cgc cgc gag ctc  acc ggc ggc cga cgg  tcg ttc att        4329
Val Glu  Arg Arg Arg Glu Leu  Thr Gly Gly Arg Arg  Ser Phe Ile
    1430             1435                 1440

ttg gtg  ccc ggc atc gat gtt  ccg ttc cac tcg cga  gtg ctg cgg        4374
Leu Val  Pro Gly Ile Asp Val  Pro Phe His Ser Arg  Val Leu Arg
    1445             1450                 1455

gtc ggg  gtg gcc gaa ttc cgg  cgc tcg ctg gac cgg  gtc atg cgg        4419
Val Gly  Val Ala Glu Phe Arg  Arg Ser Leu Asp Arg  Val Met Arg
    1460             1465                 1470

ccg acg  cgg acc cga cct gat  cat cgg gcg cta cat  tcc caa cct        4464
Pro Thr  Arg Thr Arg Pro Asp  His Arg Ala Leu His  Ser Gln Pro
    1475             1480                 1485

ggt gcc  gcg gaa gtt caa ccc  tgg acc gcg act tca  tcc agg aaa        4509
Gly Ala  Ala Glu Val Gln Pro  Trp Thr Ala Thr Ser  Ser Arg Lys
    1490             1495                 1500

tcc ggg  att tgg tgc ccc gcc  gag ccg ctc gac gag  atc ctc gcc        4554
Ser Gly  Ile Trp Cys Pro Ala  Glu Pro Leu Asp Glu  Ile Leu Ala
    1505             1510                 1515

gac tac  gac acc tgg ctt cgc  gac gac cgg cga gat  ggc gcg cac        4599
Asp Tyr  Asp Thr Trp Leu Arg  Asp Asp Arg Arg Asp  Gly Ala His
    1520             1525                 1530

ggt gtt  cat cga gct gct ggc  atg gca att cgc cag  ccc ggt gcg        4644
Gly Val  His Arg Ala Ala Gly  Met Ala Ile Arg Gln  Pro Gly Ala
    1535             1540                 1545

ctg gat  cga gac gca gga tct  gct gtt cat cga gga  ggc gcc ggc        4689
Leu Asp  Arg Asp Ala Gly Ser  Ala Val His Arg Gly  Gly Ala Gly
    1550             1555                 1560

ggg ctg  ggt gtg gag cga ttc  gtc gag atc ggt gtg  aag agc tca        4734
Gly Leu  Gly Val Glu Arg Phe  Val Glu Ile Gly Val  Lys Ser Ser
    1565             1570                 1575

ccg acg  gtg gcg ggg tct tgc  cac caa cac cct caa  act gcc cga        4779
Pro Thr  Val Ala Gly Ser Cys  His Gln His Pro Gln  Thr Ala Arg
    1580             1585                 1590

ata cgc  cca cag cac agt gaa  gtg ctc aac gcc gag  cgt gat gcg        4824
Ile Arg  Pro Gln His Ser Glu  Val Leu Asn Ala Glu  Arg Asp Ala
    1595             1600                 1605

cgg tgc  tgt tcg cca ccg aca  ccg acc cgg agc cgg  agc cgg agg        4869
Arg Cys  Cys Ser Pro Pro Thr  Pro Thr Arg Ser Arg  Ser Arg Arg
    1610             1615                 1620

aag acg  agc cgg tcg cgg aat  cgc ccg cgc cgg acg  tcg tct cgg        4914
Lys Thr  Ser Arg Ser Arg Asn  Arg Pro Arg Arg Thr  Ser Ser Arg
    1625             1630                 1635
```

236

```
aag ccg  ccc ccg tcg cgc cgg  ccg ctt cgt cgg cgg  gcc cgc gtc    4959
Lys Pro  Pro Pro Ser Arg Arg  Pro Leu Arg Arg Arg  Ala Arg Val
    1640             1645              1650

ccg acg  atc tgg ttt tcg acg  ccg ccg atg cca cgc  tgc gtg atc    5004
Pro Thr  Ile Trp Phe Ser Thr  Pro Pro Met Pro Arg  Cys Val Ile
    1655             1660              1665

gcg ctc  tcg gcc aag atg cgc  atc gac cag atc gaa  gaa ctc gac    5049
Ala Leu  Ser Ala Lys Met Arg  Ile Asp Gln Ile Glu  Glu Leu Asp
    1670             1675              1680

tcc atc  gag tcc atc acc gac  ggt gcg tcg tcg cgg  cgc aac cag    5094
Ser Ile  Glu Ser Ile Thr Asp  Gly Ala Ser Ser Arg  Arg Asn Gln
    1685             1690              1695

ctg ctg  gtg gac ctg ggc tcc  gag ctg aac ctc ggt  gcc att gaa    5139
Leu Leu  Val Asp Leu Gly Ser  Glu Leu Asn Leu Gly  Ala Ile Glu
    1700             1705              1710

cgg cgc  cgc cga atc gga cct  ggc cgg tct gcg ctc  aca ggt gac    5184
Arg Arg  Arg Arg Ile Gly Pro  Gly Arg Ser Ala Leu  Thr Gly Asp
    1715             1720              1725

caa act  ggc gcg cac cta caa  cgt tac ggc cca gtg  ctt tcc gac    5229
Gln Thr  Gly Ala His Leu Gln  Arg Tyr Gly Pro Val  Leu Ser Asp
    1730             1735              1740

gcc atc  aac gac cac gtt cgc  acc gtc ctc gga ccg  tcg ggc aag    5274
Ala Ile  Asn Asp His Val Arg  Thr Val Leu Gly Pro  Ser Gly Lys
    1745             1750              1755

cgg ccc  ggc gcc atc gcc gag  cgg gtg aag aag acc  tgg gag ctc    5319
Arg Pro  Gly Ala Ile Ala Glu  Arg Val Lys Lys Thr  Trp Glu Leu
    1760             1765              1770

ggt gag  gct ggg cca agc atg  tca ccg tcg agg tcg  cgc tgg gca    5364
Gly Glu  Ala Gly Pro Ser Met  Ser Pro Ser Arg Ser  Arg Trp Ala
    1775             1780              1785

ccc gcg  agg gca gca gcg ttc  gcg gcg gcg cca tgg  gcc acc tgc    5409
Pro Ala  Arg Ala Ala Ala Phe  Ala Ala Ala Pro Trp  Ala Thr Cys
    1790             1795              1800

acg agg  gcg cgc tgg ccg atg  ccg cct ccg tcg aca  agg tca tcg    5454
Thr Arg  Ala Arg Trp Pro Met  Pro Pro Pro Ser Thr  Arg Ser Ser
    1805             1810              1815

acg cgg  cgg tcg cat cgg tgg  ccg cgg cca ggg cgt  ttc ggt agc    5499
Thr Arg  Arg Ser His Arg Trp  Pro Arg Pro Gly Arg  Phe Gly Ser
    1820             1825              1830

gct gcg  tcg gcc ggt agt ggc  ggc gcc acc atc gac  gcg gcc gcg    5544
Ala Ala  Ser Ala Gly Ser Gly  Gly Ala Thr Ile Asp  Ala Ala Ala
    1835             1840              1845
```

237

```
ctc agc gag ttc acc gac caa atc acc ggc cgt gag ggc gtg ctg    5589
Leu Ser Glu Phe Thr Asp Gln Ile Thr Gly Arg Glu Gly Val Leu
    1850             1855             1860

cct ccg cgg ccc gcc tgg tgc tgg ggc agc tgg gac tgg acg acc    5634
Pro Pro Arg Pro Ala Trp Cys Trp Gly Ser Trp Asp Trp Thr Thr
    1865             1870             1875

cca tca acc gtt gcc ggc cgc ccc gat tcc gag ctg atc gac ttg    5679
Pro Ser Thr Val Ala Gly Arg Pro Asp Ser Glu Leu Ile Asp Leu
    1880             1885             1890

gtc acc gcc gaa ctg gga cgg act ggc cgc ggt tgg tgg cac cgg    5724
Val Thr Ala Glu Leu Gly Arg Thr Gly Arg Gly Trp Trp His Arg
    1895             1900             1905

tgt tcg acc cca aga agg ccg tcg tat tcg acg acc gct ggc cag    5769
Cys Ser Thr Pro Arg Arg Pro Ser Tyr Ser Thr Thr Ala Gly Gln
    1910             1915             1920

cgc ccg cga gga cct ggt gaa gct gtg gct gac cga cgg aag gac    5814
Arg Pro Arg Gly Pro Gly Glu Ala Val Ala Asp Arg Arg Lys Asp
    1925             1930             1935

cga agg cga cat cga cgc cga ctg gcc gcg ctg gcg gag cgc ttc    5859
Arg Arg Arg His Arg Arg Arg Leu Ala Ala Leu Ala Glu Arg Phe
    1940             1945             1950

gag ggt gcc gcc acg tcg tgg cga ccc agg cta cct ggt ggc aag    5904
Glu Gly Ala Ala Thr Ser Trp Arg Pro Arg Leu Pro Gly Gly Lys
    1955             1960             1965

gta agt cgc tcg cgc ggg ccg gca gat cca tgc atc gct gta cgg    5949
Val Ser Arg Ser Arg Gly Pro Ala Asp Pro Cys Ile Ala Val Arg
    1970             1975             1980

ccg cat gcc gcc ggc gcc gag aac ccc gaa ccc cgc gta cgg cgg    5994
Pro His Ala Ala Gly Ala Glu Asn Pro Glu Pro Arg Val Arg Arg
    1985             1990             1995

cga agt tgc cgt ggt gac cgg cgc ttc gaa ggg ttc gat cgc cgc    6039
Arg Ser Cys Arg Gly Asp Arg Arg Phe Glu Gly Phe Asp Arg Arg
    2000             2005             2010

gtc ggt ggt ggc tcg gct gct cga cgc gga gcc acc gtc atc gcg    6084
Val Gly Gly Gly Ser Ala Ala Arg Arg Gly Ala Thr Val Ile Ala
    2015             2020             2025

acc acc tcc aag ctc gac gag gag cgg ctg cgg ttc tac cgc acg    6129
Thr Thr Ser Lys Leu Asp Glu Glu Arg Leu Arg Phe Tyr Arg Thr
    2030             2035             2040

ctg tat cgc gac cac gcc cgt tac ggc gcg gcg ctg tgg ctg gtc    6174
Leu Tyr Arg Asp His Ala Arg Tyr Gly Ala Ala Leu Trp Leu Val
    2045             2050             2055
```

238

```
gcg gcg aac atg gcg tcc tac  tcc gac gtc gac gcc  ctg gtc gaa          6219
Ala Ala Asn Met Ala Ser Tyr  Ser Asp Val Asp Ala  Leu Val Glu
    2060                2065                2070

tgg atc ggc acc gaa cag acc  gaa agc ctt ggg ccg  cag tcg att          6264
Trp Ile Gly Thr Glu Gln Thr  Glu Ser Leu Gly Pro  Gln Ser Ile
    2075                2080                2085

cac atc aaa gac gcg cag acc  ccg acg ctg ctg ttc  cgt tcg cgg          6309
His Ile Lys Asp Ala Gln Thr  Pro Thr Leu Leu Phe  Arg Ser Arg
    2090                2095                2100

cgc acg cgt gtc ggg act gtc  gga ggc cgg ttc gcg  cgc cga gat          6354
Arg Thr Arg Val Gly Thr Val  Gly Gly Arg Phe Ala  Arg Arg Asp
    2105                2110                2115

gga gat gaa agt gct gct gtg  gcg gtg caa cgg ctg  atc ggc ggc          6399
Gly Asp Glu Ser Ala Ala Val  Ala Val Gln Arg Leu  Ile Gly Gly
    2120                2125                2130

ctg tcg acg atc ggc gcc gaa  cgc gac atg ccg tcg  cgg ctc gag          6444
Leu Ser Thr Ile Gly Ala Glu  Arg Asp Met Pro Ser  Arg Leu Glu
    2135                2140                2145

cgt ggt gct gcc cgg ctc gcc  caa ccg tgg cat gtt  cgg cgg cga          6489
Arg Gly Ala Ala Arg Leu Ala  Gln Pro Trp His Val  Arg Arg Arg
    2150                2155                2160

cgg gcc cta cgg cga agc caa  gtc cgc gct gga tgc  cgt ggt gac          6534
Arg Ala Leu Arg Arg Ser Gln  Val Arg Ala Gly Cys  Arg Gly Asp
    2165                2170                2175

gcg ctg gca cgc cga gtc gtc  ctg ggc ggc acg ggt  cag cct ggc          6579
Ala Leu Ala Arg Arg Val Val  Leu Gly Gly Thr Gly  Gln Pro Gly
    2180                2185                2190

gca cgc gct cat cgg ctg gac  ccg cgg cac cgg gct  gat ggg cca          6624
Ala Arg Ala His Arg Leu Asp  Pro Arg His Arg Ala  Asp Gly Pro
    2195                2200                2205

caa cga tgc cat cgt ggc cgc  cgt cga aga ggc cgg  ggt cac cac          6669
Gln Arg Cys His Arg Gly Arg  Arg Arg Arg Gly Arg  Gly His His
    2210                2215                2220

cta ctc gac cga cga gat ggc  gcg gct gct gct cga  cct gtg tca          6714
Leu Leu Asp Arg Arg Asp Gly  Ala Ala Ala Ala Arg  Pro Val Ser
    2225                2230                2235

tgc gga atc caa ggt ggc tgc  ggc cgt tcg ccg atc  aag gcc gac          6759
Cys Gly Ile Gln Gly Gly Cys  Gly Arg Ser Pro Ile  Lys Ala Asp
    2240                2245                2250

ctg acc ggg ggc ctg ccg agg  cca acc tcg aca tgg  ccg agc tgg          6804
Leu Thr Gly Gly Leu Pro Arg  Pro Thr Ser Thr Trp  Pro Ser Trp
    2255                2260                2265
```

239

```
cgg cca  agg cgc gcg agc aga  tgt cgg cag cgg cgg  ccg tcg acg    6849
Arg Pro  Arg Arg Ala Ser Arg  Cys Arg Gln Arg Arg  Pro Ser Thr
    2270             2275              2280

agg acg  ccg agg ccc ctg gcg  cca tcg ccg cgc tgc  cgt cgc cgc    6894
Arg Thr  Pro Arg Pro Leu Ala  Pro Ser Pro Arg Cys  Arg Arg Arg
    2285             2290              2295

ccc ggt  ttc acc ccc gca ccg  ccg ccg caa tgg gac  gac ctc gat    6939
Pro Gly  Phe Thr Pro Ala Pro  Pro Pro Gln Trp Asp  Asp Leu Asp
    2300             2305              2310

gtc gac  ccg gcc gac ctg gtg  gtg atc gtc ggc ggc  cgc gaa atc    6984
Val Asp  Pro Ala Asp Leu Val  Val Ile Val Gly Gly  Arg Glu Ile
    2315             2320              2325

ggc ccg  tac ggc tcg tca cgc  acc cgg ttc gag atg  gag gtc gaa    7029
Gly Pro  Tyr Gly Ser Ser Arg  Thr Arg Phe Glu Met  Glu Val Glu
    2330             2335              2340

aac gag  ctg tcg gcg gcc ggc  gtg ctg gag ctg gcc  tgg acc act    7074
Asn Glu  Leu Ser Ala Ala Gly  Val Leu Glu Leu Ala  Trp Thr Thr
    2345             2350              2355

ggg ttg  atc gct ggg aga cga  ccc gca acc cgg ttg  gta cga cac    7119
Gly Leu  Ile Ala Gly Arg Arg  Pro Ala Thr Arg Leu  Val Arg His
    2360             2365              2370

cga atc  cgg cga aat ggt cga  cga atc cga gtt ggt  gca gcg cta    7164
Arg Ile  Arg Arg Asn Gly Arg  Arg Ile Arg Val Gly  Ala Ala Leu
    2375             2380              2385

cac gac  gcc gtg gtg cag cgc  gtc ggc att cgc gaa  ttc gtt gat    7209
His Asp  Ala Val Val Gln Arg  Val Gly Ile Arg Glu  Phe Val Asp
    2390             2395              2400

gac ggc  gcg atc gac ccc gac  cac gcc tcg ccg ctg  ctg gtg tcg    7254
Asp Gly  Ala Ile Asp Pro Asp  His Ala Ser Pro Leu  Leu Val Ser
    2405             2410              2415

gtg ttc  ctg gag aag gac ttc  gcg ttc gtg gtg tcc  tcg gag gcc    7299
Val Phe  Leu Glu Lys Asp Phe  Ala Phe Val Val Ser  Ser Glu Ala
    2420             2425              2430

gat gcg  cgc gcc ttc gtc gag  ttc gat ccc gag cac  acg gtc atc    7344
Asp Ala  Arg Ala Phe Val Glu  Phe Asp Pro Glu His  Thr Val Ile
    2435             2440              2445

cgg ccg  gtg ccc gac tcc acc  gac tgg cag gtc atc  cgc aag gcc    7389
Arg Pro  Val Pro Asp Ser Thr  Asp Trp Gln Val Ile  Arg Lys Ala
    2450             2455              2460

ggc acc  gag atc cgg gtg ccg  cga aag acc aag ctg  tcc cgc gtc    7434
Gly Thr  Glu Ile Arg Val Pro  Arg Lys Thr Lys Leu  Ser Arg Val
    2465             2470              2475
```

240

```
gtc ggc  ggc cag atc ccg acc  ggg ttc gac ccg acg  gtg tgg ggc      7479
Val Gly  Gly Gln Ile Pro Thr  Gly Phe Asp Pro Thr  Val Trp Gly
    2480             2485                2490

atc agc  gca gac atg gcc ggt  tcc atc gac cgg ttg  gcg gta tgg      7524
Ile Ser  Ala Asp Met Ala Gly  Ser Ile Asp Arg Leu  Ala Val Trp
    2495             2500                2505

aac atg  tgg cgg acc gtc gac  cgg ttc ctg tcg tcc  ggt ttc agc      7569
Asn Met  Trp Arg Thr Val Asp  Arg Phe Leu Ser Ser  Gly Phe Ser
    2510             2515                2520

ccg gcc  gag gtg atg cgt tac  gtg cac ccg agt ttg  gtg gcc aac      7614
Pro Ala  Glu Val Met Arg Tyr  Val His Pro Ser Leu  Val Ala Asn
    2525             2530                2535

acc cag  ggc acc ggc atg ggc  ggc ggc acg tcg atg  cag acg atg      7659
Thr Gln  Gly Thr Gly Met Gly  Gly Gly Thr Ser Met  Gln Thr Met
    2540             2545                2550

tac cac  ggc aat ctg ttg ggc  cgc aac aag ccg aac  gac atc ttc      7704
Tyr His  Gly Asn Leu Leu Gly  Arg Asn Lys Pro Asn  Asp Ile Phe
    2555             2560                2565

cag gaa  gtc ttg ccg ata tca  ttc gcc gcg cac gtg  gtt cag tcc      7749
Gln Glu  Val Leu Pro Ile Ser  Phe Ala Ala His Val  Val Gln Ser
    2570             2575                2580

tac gtc  ggt agc tac ggt gcg  atg atc cac ccg gta  gcc gcg tgc      7794
Tyr Val  Gly Ser Tyr Gly Ala  Met Ile His Pro Val  Ala Ala Cys
    2585             2590                2595

gcc acc  gcc gcg gtg tcg gtc  gag gaa ggt gtc gac  aag atc cgg      7839
Ala Thr  Ala Ala Val Ser Val  Glu Glu Gly Val Asp  Lys Ile Arg
    2600             2605                2610

ttg gga  agg ctc aac tgg tgg  tcg gcg gcc gtg gat  gac ctg acg      7884
Leu Gly  Arg Leu Asn Trp Trp  Ser Ala Ala Val Asp  Asp Leu Thr
    2615             2620                2625

ctg gag  ggc atc atc gga ttc  ggt gac atg gcc gcc  acc gcc gac      7929
Leu Glu  Gly Ile Ile Gly Phe  Gly Asp Met Ala Ala  Thr Ala Asp
    2630             2635                2640

acg tcc  atg atg cgc ggc cgc  ggc atc cac gac tcg  aag ttt tcc      7974
Thr Ser  Met Met Arg Gly Arg  Gly Ile His Asp Ser  Lys Phe Ser
    2645             2650                2655

cgg ccc  aac gac cgc cgc cgt  ctg gct tcg tcg aag  ccc aag gcg      8019
Arg Pro  Asn Asp Arg Arg Arg  Leu Ala Ser Ser Lys  Pro Lys Ala
    2660             2665                2670

gcg gga  cga tcc tgt tgg gcg  cgg gga cct ggc gct  gcg gat ggg      8064
Ala Gly  Arg Ser Cys Trp Ala  Arg Gly Pro Gly Ala  Ala Asp Gly
    2675             2680                2685
```

241

```
gct gcc  ggt gct ggc ggt ggt  ggg ttc gcg cag tcg  ttc ggc gac      8109
Ala Ala  Gly Ala Gly Gly Gly  Gly Phe Ala Gln Ser  Phe Gly Asp
    2690             2695               2700

ggc gtg  cac acc tcg atc cgc  ccc ggg cct ggg cgc  gct ggg ggc      8154
Gly Val  His Thr Ser Ile Arg  Pro Gly Pro Gly Arg  Ala Gly Gly
    2705             2710               2715

ggc gcg  cgg cgg caa gga ttc  agc tgc ggc ggg cgc  tgg cca agc      8199
Gly Ala  Arg Arg Gln Gly Phe  Ser Cys Gly Gly Arg  Trp Pro Ser
    2720             2725               2730

tgc gtg  gcc gcc gac gac gtg  gcg gtc atc tcc aag  cac gac acc      8244
Cys Val  Ala Ala Asp Asp Val  Ala Val Ile Ser Lys  His Asp Thr
    2735             2740               2745

tcg acg  ctg gcc aac gat ccc  aac gag acc gag ttg  cat gaa cgg      8289
Ser Thr  Leu Ala Asn Asp Pro  Asn Glu Thr Glu Leu  His Glu Arg
    2750             2755               2760

ctc gcc  gac gcc ctg ggc cgt  tcc gag ggc gcc ccg  ctg ttc gtg      8334
Leu Ala  Asp Ala Leu Gly Arg  Ser Glu Gly Ala Pro  Leu Phe Val
    2765             2770               2775

gtg tcg  cag aag agc ctg acc  ggc cag cca agg gcg  gcg cgg cgg      8379
Val Ser  Gln Lys Ser Leu Thr  Gly Gln Pro Arg Ala  Ala Arg Arg
    2780             2785               2790

tct tcc  aga tga                                                    8391
Ser Ser  Arg
    2795
```

```
<210>  114
<211>  2796
<212>  PRT
<213>  Mycobacterium bovis

<400>  114

Met Gly Thr Arg Thr Gly Gly Arg Gly Pro Gly Ser Val Arg Gln Ala
1               5                   10                  15

Pro Asp Val Gly Arg Arg Val Gly Ala Arg Arg Val Ala Tyr Pro Asp
            20                  25                  30

Arg Gly Asp Pro Gly Ala Gly Pro Ser Arg His Gly Pro Arg Gly His
            35                  40                  45

Pro Ala Gly Arg His Gly Gly His Ser Gln Gly Val Leu Ala Val Glu
    50                  55                  60
```

242

```
Ala Leu Lys Ala Gly Gly Ala Arg Asp Val Glu Leu Phe Ala Leu Ala
65              70              75                      80

Gln Leu Ile Gly Ala Ala Gly Thr Leu Val Ala Arg Arg Arg Glu Phe
                85              90                      95

Pro Ser Trp Ala Ile Ala Pro Met Val Ser Val Thr Asn Ala Asp Pro
            100             105             110

Glu Arg Ile Gly Arg Leu Leu Asp Glu Phe Ala Gln Asp Val Arg Thr
            115             120             125

Val Leu Pro Pro Val Leu Ser Ile Arg Asn Gly Arg Arg Ala Val Val
    130             135             140

Ile Thr Gly Thr Pro Glu Gln Leu Ser Arg Phe Glu Leu Tyr Cys Arg
145             150             155             160

Gln Ile Ser Glu Lys Glu Glu Ala Asp Arg Lys Asn Lys Val Arg Gly
            165             170             175

Gly Asp Val Phe Ser Pro Val Phe Glu Pro Val Gln Val Glu Val Gly
            180             185             190

Phe His Thr Pro Arg Leu Ser Asp Gly Ile Asp Ile Val Ala Gly Trp
        195             200             205

Ala Glu Lys Ala Gly Leu Asp Val Ala Leu Ala Arg Glu Leu Ala Asp
    210             215             220

Ala Ile Leu Ile Arg Lys Val Asp Trp Val Asp Glu Ile Thr Arg Val
225             230             235             240

His Arg Ala Gly Ala Arg Trp Ile Leu Asp Leu Gly Pro Gly Asp Ile
            245             250             255

Leu Thr Arg Leu Thr Ala Pro Val Ile Arg Gly Leu Gly Ile Gly Ile
            260             265             270

Val Pro Ala Arg Thr Arg Gly Gly Gln Arg Asn Leu Phe Thr Val Gly
    275             280             285
```

243

```
Ala Thr Pro Glu Val Ala Arg Ala Trp Ser Ser Tyr Ala Pro Thr Val
    290             295             300

Val Arg Leu Pro Asp Gly Arg Val Lys Leu Ser Thr Lys Phe Thr Arg
305             310             315             320

Leu Thr Arg Arg Ser Pro Ile Leu Leu Ala Gly Met Thr Pro Thr Thr
            325             330             335

Val Asp Ala Lys Ile Val Ala Ala Ala Asn Gly Arg His Trp Ala
            340             345             350

Glu Leu Ala Ala Arg Gly Arg Ser Pro Lys Arg Ser Ser Val Thr Ala
        355             360             365

Ser Asn Lys Trp Pro Ala Cys Ser Ser Arg Ala Ala Pro Ile Ser Ser
    370             375             380

Thr Arg Cys Ser Ser Ile Pro Thr Cys Glu Ala Ser Gly Gly Arg Gln
385             390             395             400

Ala Val Gly Ala Glu Gly Pro Pro Val Arg Arg Arg Asp Arg Arg Arg
            405             410             415

Gly Asp Gln Arg Arg His Pro Arg Pro Arg Arg Gly Arg Arg Ala Asp
        420             425             430

Arg Arg Thr Gly Arg His Arg His Gln Pro Arg Arg Val Gln Thr Arg
        435             440             445

Asp His Arg Ala Asp Pro Leu Gly Asp Ser His Arg His Arg Gly Ala
    450             455             460

His Gln Ala Gly Asp His Ala Arg Arg Gly Pro Gly Ala Pro Ala Gly
465             470             475             480

Thr Ile Pro Gly Arg Ile Ser His Leu Leu Leu Ala Thr Tyr Ser Ala
            485             490             495

Asp Arg Ala Pro Arg Gln His His Val Cys Val Gly Gly Gly His Leu
        500             505             510
```

244

```
Gly Thr Pro Lys Lys Gly Cys Gly Tyr Leu Ser Gly Pro Gly Arg Ser
         515         520             525


Val Arg Leu Pro Ile Asp Ala Asp Arg Arg Ile Leu Val Gly Thr Ala
     530         535             540


Ala Met Ala Thr Lys Glu Ser Thr Thr Ser Pro Ser Val Lys Arg Met
545             550             555             560


Leu Val Asp Thr Gln Gly Thr Asp Gln Trp Ile Ser Ala Gly Lys Ala
             565             570             575


Gln Gly Arg Met Pro Pro Ala Glu Ser Ala Arg Cys Arg His Pro Arg
             580             585             590


Asp Arg His Ser Ala Ser Val Arg Arg Cys Ser Thr Arg Trp Pro Val
         595             600             605


Thr Arg Arg Arg Ser Arg Ser Val Ala Trp Pro Arg Pro Pro Ser Pro
    610             615             620


Thr Cys Arg Arg Arg Arg His Asp Leu Pro Ala Val Ala Ala Gly Ala
625             630             635             640


Thr Ser Asn Trp Pro Ser Gly Lys Ala Thr Arg Pro Pro Thr Pro Pro
             645             650             655


Arg Trp Ala Ala Arg Gly Trp Pro Thr Leu Ala Gly Pro Leu Arg Ala
         660             665             670


Asp Ala Ala Ala Cys Arg Ser Pro Val Ala Pro Thr Gly Phe Arg Pro
     675             680             685


Asp Pro Asp Ala Ile His Arg Cys Trp Pro Ala Gly Gln Ser Ala Ala
     690             695             700


Ala Ile Ala Ala Leu Val Ala Arg Tyr Pro Asp Ala Glu Thr Val Gln
705             710             715             720


Leu His Pro Ala Asp Val Pro Phe Phe Val Thr Leu Cys Lys Thr Leu
             725             730             735
```

245

Gly Lys Pro Val Asn Phe Val Pro Ala Ile Asp Leu Val Val Arg Ala
        740   745   750

Gly Gly Ala Ala Thr Arg Cys Gly Arg Pro Thr Thr Pro Ala Thr Thr
        755   760   765

Pro Met Arg Cys Ala Ser Phe Arg Ala Arg Val Gly Ser Arg Ile Thr
    770   775   780

Arg Met Asp Glu Pro Val Gly Glu Leu Leu Asp Ala Phe Glu Gln Ala
785   790   795   800

Ala Ile Asp Glu Val Leu Gly Ala Gly Val Glu Pro Lys Asp Val Ala
        805   810   815

Ser Gly Arg Leu Gly Arg Ala Asp Val Ala Gly Pro Leu Ala Val Val
        820   825   830

Leu Asp Ala Pro Asp Val Arg Trp Ala Gly Arg Thr Val Thr Asn Pro
        835   840   845

Val His Arg Ile Arg Asp Pro Ala Glu Trp Gln Val His Asp Gly Pro
    850   855   860

Glu Asn Pro Arg Ala Ala His Ser Ser Thr Gly Ala Arg Leu Gln Thr
865   870   875   880

His Gly Asp Asp Val Ala Leu Ser Val Ala Arg Leu Gly His Leu Gly
            885   890   895

Arg His Pro Ile His Val Ala Gly Gln His Arg Arg Trp Arg His Pro
        900   905   910

Gly Asp Arg His Arg Gly Arg His His Ala Met Arg Thr Val Leu Arg
    915   920   925

Ser Pro Pro Val Ser Thr Ala Arg Ser Ser Cys Cys Gly Gly Gln Arg
    930   935   940

Asp Gly His Phe Asp Gly Gly Leu Ala Pro Arg Ala Cys Cys Arg Pro
945   950   955   960

246

His Arg His Arg His Val Arg Cys Ala Leu Ala Pro Ser Leu Thr Asn
            965   970   975

Val Pro Thr Arg Leu Val Gly Pro Cys Trp Pro Ala Val Phe Ala Ala
            980   985   990

Ile Gly Ser Ala Val Thr Asp Thr Gly Glu Pro Val Val Glu Gly Leu
            995   1000   1005

Leu Ser Leu Val His Leu Asp Thr Arg Pro Arg Val Val Gly Gln
     1010   1015   1020

Leu Pro Thr Val Pro Ala Gln Leu Thr Val Thr Gln Arg Leu Pro
     1025   1030   1035

Thr Gln Pro Ile Arg Thr Trp Ala Ala Ser Cys Arg Ser Arg Ser
     1040   1045   1050

Ser Phe Thr Ala Trp Arg Arg Asp Arg His Ser Arg Gly Ala Ile
     1055   1060   1065

Arg Asp Pro Gly Ser His Arg Phe Ala Glu Leu Asp Arg Arg Glu
     1070   1075   1080

Pro Val Ala Arg Cys Arg Glu Arg His Arg His Pro Ala Arg Arg
     1085   1090   1095

Arg Arg Asp Val Thr Ile Thr Ala Pro Val Asp Met Arg Pro Phe
     1100   1105   1110

Ala Val Val Ser Gly Asp His Asn Pro Ile His Thr Asp Arg Ala
     1115   1120   1125

Ala Ala Ala Cys Arg Pro Gly Val Ala Asp Arg Ala Arg His Val
     1130   1135   1140

Ala Val Gly Arg Gly Ala Thr Arg Gly Asp Arg His Arg Arg Ala
     1145   1150   1155

Gly Pro Pro Pro Ala Arg Leu Val Gly Trp Thr Ala Arg Phe Leu
     1160   1165   1170

247

```
Gly Met  Val Ala Pro Ala Thr  Arg Trp Thr Ser Gly  Arg Ala Arg
    1175                 1180             1185

Arg Ile  Asp Gln Gly Ala Glu  Ile Val Asp Val Ala  Ala Arg Val
    1190                 1195             1200

Gly Ser  Asp Leu Val Met Ser  Ala Ser Ala Arg Leu  Ala Ala Pro
    1205                 1210             1215

Lys Thr  Val Tyr Ala Phe Pro  Gly Gln Gly Ile Gln  His Lys Gly
    1220                 1225             1230

Met Gly  Met Glu Val Arg Ala  Ala Pro Arg Arg Pro  Ala Arg Cys
    1235                 1240             1245

Gly Thr  Pro Arg Thr Ser Ser  Pro Ala Thr Pro Trp  Ala Ser Arg
    1250                 1255             1260

Tyr Cys  Thr Trp Ser Ala Thr  Thr Arg Pro Ala Ser  Ser Pro Ala
    1265                 1270             1275

Val Cys  Thr Thr Thr Thr Asp  Gly Val Leu Tyr Leu  Thr Gln Phe
    1280                 1285             1290

Thr Gln  Val Ala Met Ala Thr  Val Ala Ala Gly Gln  Val Ala Glu
    1295                 1300             1305

Met Arg  Glu Gln Gly Ala Phe  Val Glu Gly Ala Ile  Ala Cys Gly
    1310                 1315             1320

His Ser  Val Gly Glu Tyr Thr  Ala Leu Ala Cys Val  Thr Gly Ile
    1325                 1330             1335

Tyr Gln  Leu Glu Ala Leu Leu  Glu Met Val Phe His  Arg Gly Ser
    1340                 1345             1350

Lys Met  His Asp Ile Val Pro  Arg Asp Glu Leu Gly  Arg Ser Asn
    1355                 1360             1365

Tyr Arg  Leu Ser Ala Ile Arg  Pro Ser Gln Ile Asp  Leu Asp Asp
    1370                 1375             1380
```

248

Ala Asp Val Pro Ala Phe Val Ala Gly Ile Ala Glu Ser Thr Gly
    1385   1390   1395

Glu Phe Leu Glu Ile Glu Asn Phe Asn Leu Gly Gly Ser Gln Tyr
    1400   1405   1410

Ala Ile Ala Gly Thr Val Arg Gly Leu Glu Ala Leu Glu Ala Glu
    1415   1420   1425

Val Glu Arg Arg Arg Glu Leu Thr Gly Gly Arg Arg Ser Phe Ile
    1430   1435   1440

Leu Val Pro Gly Ile Asp Val Pro Phe His Ser Arg Val Leu Arg
    1445   1450   1455

Val Gly Val Ala Glu Phe Arg Arg Ser Leu Asp Arg Val Met Arg
    1460   1465   1470

Pro Thr Arg Thr Arg Pro Asp His Arg Ala Leu His Ser Gln Pro
    1475   1480   1485

Gly Ala Ala Glu Val Gln Pro Trp Thr Ala Thr Ser Ser Arg Lys
    1490   1495   1500

Ser Gly Ile Trp Cys Pro Ala Glu Pro Leu Asp Glu Ile Leu Ala
    1505   1510   1515

Asp Tyr Asp Thr Trp Leu Arg Asp Asp Arg Arg Asp Gly Ala His
    1520   1525   1530

Gly Val His Arg Ala Ala Gly Met Ala Ile Arg Gln Pro Gly Ala
    1535   1540   1545

Leu Asp Arg Asp Ala Gly Ser Ala Val His Arg Gly Gly Ala Gly
    1550   1555   1560

Gly Leu Gly Val Glu Arg Phe Val Glu Ile Gly Val Lys Ser Ser
    1565   1570   1575

Pro Thr Val Ala Gly Ser Cys His Gln His Pro Gln Thr Ala Arg
    1580   1585   1590

249

```
Ile Arg  Pro Gln His Ser Glu  Val Leu Asn Ala Glu  Arg Asp Ala
    1595              1600              1605


Arg Cys  Cys Ser Pro Pro Thr  Pro Thr Arg Ser Arg  Ser Arg Arg
    1610              1615              1620


Lys Thr  Ser Arg Ser Arg Asn  Arg Pro Arg Arg Thr  Ser Ser Arg
    1625              1630              1635


Lys Pro  Pro Pro Ser Arg Arg  Pro Leu Arg Arg Arg  Ala Arg Val
    1640              1645              1650


Pro Thr  Ile Trp Phe Ser Thr  Pro Pro Met Pro Arg  Cys Val Ile
    1655              1660              1665


Ala Leu  Ser Ala Lys Met Arg  Ile Asp Gln Ile Glu  Glu Leu Asp
    1670              1675              1680


Ser Ile  Glu Ser Ile Thr Asp  Gly Ala Ser Ser Arg  Arg Asn Gln
    1685              1690              1695


Leu Leu  Val Asp Leu Gly Ser  Glu Leu Asn Leu Gly  Ala Ile Glu
    1700              1705              1710


Arg Arg  Arg Arg Ile Gly Pro  Gly Arg Ser Ala Leu  Thr Gly Asp
    1715              1720              1725


Gln Thr  Gly Ala His Leu Gln  Arg Tyr Gly Pro Val  Leu Ser Asp
    1730              1735              1740


Ala Ile  Asn Asp His Val Arg  Thr Val Leu Gly Pro  Ser Gly Lys
    1745              1750              1755


Arg Pro  Gly Ala Ile Ala Glu  Arg Val Lys Lys Thr  Trp Glu Leu
    1760              1765              1770


Gly Glu  Ala Gly Pro Ser Met  Ser Pro Ser Arg Ser  Arg Trp Ala
    1775              1780              1785


Pro Ala  Arg Ala Ala Ala Phe  Ala Ala Ala Pro Trp  Ala Thr Cys
    1790              1795              1800
```

250

```
Thr Arg  Ala Arg Trp Pro Met   Pro Pro Pro Ser Thr   Arg Ser Ser
    1805             1810                1815

Thr Arg  Arg Ser His Arg Trp   Pro Arg Pro Gly Arg   Phe Gly Ser
    1820             1825                1830

Ala Ala  Ser Ala Gly Ser Gly   Gly Ala Thr Ile Asp   Ala Ala Ala
    1835             1840                1845

Leu Ser  Glu Phe Thr Asp Gln   Ile Thr Gly Arg Glu   Gly Val Leu
    1850             1855                1860

Pro Pro  Arg Pro Ala Trp Cys   Trp Gly Ser Trp Asp   Trp Thr Thr
    1865             1870                1875

Pro Ser  Thr Val Ala Gly Arg   Pro Asp Ser Glu Leu   Ile Asp Leu
    1880             1885                1890

Val Thr  Ala Glu Leu Gly Arg   Thr Gly Arg Gly Trp   Trp His Arg
    1895             1900                1905

Cys Ser  Thr Pro Arg Arg Pro   Ser Tyr Ser Thr Thr   Ala Gly Gln
    1910             1915                1920

Arg Pro  Arg Gly Pro Gly Glu   Ala Val Ala Asp Arg   Arg Lys Asp
    1925             1930                1935

Arg Arg  Arg His Arg Arg Arg   Leu Ala Ala Leu Ala   Glu Arg Phe
    1940             1945                1950

Glu Gly  Ala Ala Thr Ser Trp   Arg Pro Arg Leu Pro   Gly Gly Lys
    1955             1960                1965

Val Ser  Arg Ser Arg Gly Pro   Ala Asp Pro Cys Ile   Ala Val Arg
    1970             1975                1980

Pro His  Ala Ala Gly Ala Glu   Asn Pro Glu Pro Arg   Val Arg Arg
    1985             1990                1995

Arg Ser  Cys Arg Gly Asp Arg   Arg Phe Glu Gly Phe   Asp Arg Arg
    2000             2005                2010
```

251

```
Val Gly  Gly Gly Ser Ala Ala  Arg Arg Gly Ala Thr  Val Ile Ala
    2015             2020                2025

Thr Thr  Ser Lys Leu Asp Glu  Glu Arg Leu Arg Phe  Tyr Arg Thr
    2030             2035                2040

Leu Tyr  Arg Asp His Ala Arg  Tyr Gly Ala Ala Leu  Trp Leu Val
    2045             2050                2055

Ala Ala  Asn Met Ala Ser Tyr  Ser Asp Val Asp Ala  Leu Val Glu
    2060             2065                2070

Trp Ile  Gly Thr Glu Gln Thr  Glu Ser Leu Gly Pro  Gln Ser Ile
    2075             2080                2085

His Ile  Lys Asp Ala Gln Thr  Pro Thr Leu Leu Phe  Arg Ser Arg
    2090             2095                2100

Arg Thr  Arg Val Gly Thr Val  Gly Gly Arg Phe Ala  Arg Arg Asp
    2105             2110                2115

Gly Asp  Glu Ser Ala Ala Val  Ala Val Gln Arg Leu  Ile Gly Gly
    2120             2125                2130

Leu Ser  Thr Ile Gly Ala Glu  Arg Asp Met Pro Ser  Arg Leu Glu
    2135             2140                2145

Arg Gly  Ala Ala Arg Leu Ala  Gln Pro Trp His Val  Arg Arg Arg
    2150             2155                2160

Arg Ala  Leu Arg Arg Ser Gln  Val Arg Ala Gly Cys  Arg Gly Asp
    2165             2170                2175

Ala Leu  Ala Arg Arg Val Val  Leu Gly Gly Thr Gly  Gln Pro Gly
    2180             2185                2190

Ala Arg  Ala His Arg Leu Asp  Pro Arg His Arg Ala  Asp Gly Pro
    2195             2200                2205

Gln Arg  Cys His Arg Gly Arg  Arg Arg Arg Gly Arg  Gly His His
    2210             2215                2220
```

252

```
Leu Leu  Asp Arg Arg Asp Gly  Ala Ala Ala Ala Arg  Pro Val Ser
    2225                2230              2235

Cys Gly  Ile Gln Gly Gly Cys  Gly Arg Ser Pro Ile  Lys Ala Asp
    2240                2245              2250

Leu Thr  Gly Gly Leu Pro Arg  Pro Thr Ser Thr Trp  Pro Ser Trp
    2255                2260              2265

Arg Pro  Arg Arg Ala Ser Arg  Cys Arg Gln Arg Arg  Pro Ser Thr
    2270                2275              2280

Arg Thr  Pro Arg Pro Leu Ala  Pro Ser Pro Arg Cys  Arg Arg Arg
    2285                2290              2295

Pro Gly  Phe Thr Pro Ala Pro  Pro Pro Gln Trp Asp  Asp Leu Asp
    2300                2305              2310

Val Asp  Pro Ala Asp Leu Val  Val Ile Val Gly Gly  Arg Glu Ile
    2315                2320              2325

Gly Pro  Tyr Gly Ser Ser Arg  Thr Arg Phe Glu Met  Glu Val Glu
    2330                2335              2340

Asn Glu  Leu Ser Ala Ala Gly  Val Leu Glu Leu Ala  Trp Thr Thr
    2345                2350              2355

Gly Leu  Ile Ala Gly Arg Arg  Pro Ala Thr Arg Leu  Val Arg His
    2360                2365              2370

Arg Ile  Arg Arg Asn Gly Arg  Arg Ile Arg Val Gly  Ala Ala Leu
    2375                2380              2385

His Asp  Ala Val Val Gln Arg  Val Gly Ile Arg Glu  Phe Val Asp
    2390                2395              2400

Asp Gly  Ala Ile Asp Pro Asp  His Ala Ser Pro Leu  Leu Val Ser
    2405                2410              2415

Val Phe  Leu Glu Lys Asp Phe  Ala Phe Val Val Ser  Ser Glu Ala
    2420                2425              2430
```

253

```
Asp Ala  Arg Ala Phe Val Glu  Phe Asp Pro Glu His   Thr Val Ile
    2435                  2440              2445

Arg Pro  Val Pro Asp Ser Thr  Asp Trp Gln Val Ile   Arg Lys Ala
    2450                  2455              2460

Gly Thr  Glu Ile Arg Val Pro  Arg Lys Thr Lys Leu   Ser Arg Val
    2465                  2470              2475

Val Gly  Gly Gln Ile Pro Thr  Gly Phe Asp Pro Thr   Val Trp Gly
    2480                  2485              2490

Ile Ser  Ala Asp Met Ala Gly  Ser Ile Asp Arg Leu   Ala Val Trp
    2495                  2500              2505

Asn Met  Trp Arg Thr Val Asp  Arg Phe Leu Ser Ser   Gly Phe Ser
    2510                  2515              2520

Pro Ala  Glu Val Met Arg Tyr  Val His Pro Ser Leu   Val Ala Asn
    2525                  2530              2535

Thr Gln  Gly Thr Gly Met Gly  Gly Gly Thr Ser Met   Gln Thr Met
    2540                  2545              2550

Tyr His  Gly Asn Leu Leu Gly  Arg Asn Lys Pro Asn   Asp Ile Phe
    2555                  2560              2565

Gln Glu  Val Leu Pro Ile Ser  Phe Ala Ala His Val   Val Gln Ser
    2570                  2575              2580

Tyr Val  Gly Ser Tyr Gly Ala  Met Ile His Pro Val   Ala Ala Cys
    2585                  2590              2595

Ala Thr  Ala Ala Val Ser Val  Glu Glu Gly Val Asp   Lys Ile Arg
    2600                  2605              2610

Leu Gly  Arg Leu Asn Trp Trp  Ser Ala Ala Val Asp   Asp Leu Thr
    2615                  2620              2625

Leu Glu  Gly Ile Ile Gly Phe  Gly Asp Met Ala Ala   Thr Ala Asp
    2630                  2635              2640
```

254

```
Thr Ser  Met Met Arg Gly Arg  Gly Ile His Asp Ser  Lys Phe Ser
    2645                   2650              2655

Arg Pro  Asn Asp Arg Arg Arg  Leu Ala Ser Ser Lys  Pro Lys Ala
    2660                   2665              2670

Ala Gly  Arg Ser Cys Trp Ala  Arg Gly Pro Gly Ala  Ala Asp Gly
    2675                   2680              2685

Ala Ala  Gly Ala Gly Gly Gly  Gly Phe Ala Gln Ser  Phe Gly Asp
    2690                   2695              2700

Gly Val  His Thr Ser Ile Arg  Pro Gly Pro Gly Arg  Ala Gly Gly
    2705                   2710              2715

Gly Ala  Arg Arg Gln Gly Phe  Ser Cys Gly Gly Arg  Trp Pro Ser
    2720                   2725              2730

Cys Val  Ala Ala Asp Asp Val  Ala Val Ile Ser Lys  His Asp Thr
    2735                   2740              2745

Ser Thr  Leu Ala Asn Asp Pro  Asn Glu Thr Glu Leu  His Glu Arg
    2750                   2755              2760

Leu Ala  Asp Ala Leu Gly Arg  Ser Glu Gly Ala Pro  Leu Phe Val
    2765                   2770              2775

Val Ser  Gln Lys Ser Leu Thr  Gly Gln Pro Arg Ala  Ala Arg Arg
    2780                   2785              2790

Ser Ser  Arg
    2795


<210>  115
<211>  192
<212>  DNA
<213>  Homo sapiens

<220>
<221>  CDS
<222>  (1)..(192)
<223>
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255

<400> 115

```
gat ctt gct gcc cga aac tgc ctg gta ggg gag aac cac ttg gtg aag        48
Asp Leu Ala Ala Arg Asn Cys Leu Val Gly Glu Asn His Leu Val Lys
1               5               10                  15

gta gct gat ttt ggc ctg agc agg ttg atg aca ggg gac acc tac aca        96
Val Ala Asp Phe Gly Leu Ser Arg Leu Met Thr Gly Asp Thr Tyr Thr
            20                  25                  30

gcc cat gct gga gcc aag ttc ccc atc aaa tgg act gca ccc gag agc        144
Ala His Ala Gly Ala Lys Phe Pro Ile Lys Trp Thr Ala Pro Glu Ser
        35                  40                  45

ctg gcc tac aac aag ttc tcc atc aag tcc gac gtc tgg ggt aag ggc        192
Leu Ala Tyr Asn Lys Phe Ser Ile Lys Ser Asp Val Trp Gly Lys Gly
    50                  55                  60
```

<210> 116
<211> 64
<212> PRT
<213> Homo sapiens

<400> 116

```
Asp Leu Ala Ala Arg Asn Cys Leu Val Gly Glu Asn His Leu Val Lys
1               5               10                  15


Val Ala Asp Phe Gly Leu Ser Arg Leu Met Thr Gly Asp Thr Tyr Thr
            20                  25                  30


Ala His Ala Gly Ala Lys Phe Pro Ile Lys Trp Thr Ala Pro Glu Ser
        35                  40                  45


Leu Ala Tyr Asn Lys Phe Ser Ile Lys Ser Asp Val Trp Gly Lys Gly
    50                  55                  60
```

<210> 117
<211> 3955
<212> DNA
<213> Rattus norvegicus

<220>
<221> CDS
<222> (17)..(3799)
<223>

<400> 117

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ccgggccgga gccgca atg atc atc atg gag ctg gcg gcc tgg tgc cgc tgg        52
               Met Ile Ile Met Glu Leu Ala Ala Trp Cys Arg Trp
               1               5                   10
```

256

```
ggg ttc ctc ctc gcc ctc ctg ccc ccc gga atc gcg ggc acc caa gtg        100
Gly Phe Leu Leu Ala Leu Leu Pro Pro Gly Ile Ala Gly Thr Gln Val
        15                  20                  25

tgt acc ggc aca gac atg aag ttg cgg ctc cct gcc agt cct gag acc        148
Cys Thr Gly Thr Asp Met Lys Leu Arg Leu Pro Ala Ser Pro Glu Thr
    30                  35                  40

cac ctg gac atg ctc cgc cac ctg tac cag ggc tgt cag gta gtg cag        196
His Leu Asp Met Leu Arg His Leu Tyr Gln Gly Cys Gln Val Val Gln
45                  50                  55                  60

ggc aac ttg gag ctt acc tac gtg cct gcc aat gcc agc ctc tca ttc        244
Gly Asn Leu Glu Leu Thr Tyr Val Pro Ala Asn Ala Ser Leu Ser Phe
                65                  70                  75

ctg cag gac atc cag gaa gtt cag ggt tac atg ctc atc gct cac aac        292
Leu Gln Asp Ile Gln Glu Val Gln Gly Tyr Met Leu Ile Ala His Asn
            80                  85                  90

cag gtg aag cgc gtc cca ctg caa agg ctg cgc atc gtg aga ggg acc        340
Gln Val Lys Arg Val Pro Leu Gln Arg Leu Arg Ile Val Arg Gly Thr
            95                  100                 105

cag ctc ttt gag gac aag tat gcc ctg gct gtg cta gac aac cga gat        388
Gln Leu Phe Glu Asp Lys Tyr Ala Leu Ala Val Leu Asp Asn Arg Asp
    110                 115                 120

cct cag gac aat gtc gcc gcc tcc acc cca ggc aga acc cca gag ggg        436
Pro Gln Asp Asn Val Ala Ala Ser Thr Pro Gly Arg Thr Pro Glu Gly
125                 130                 135                 140

ctg cgg gag ctg cag ctt cga agt ctc aca gag atc ctg aag gga gga        484
Leu Arg Glu Leu Gln Leu Arg Ser Leu Thr Glu Ile Leu Lys Gly Gly
                145                 150                 155

gtt ttg atc cgt ggg aac cct cag ctc tgc tac cag gac atg gtt ttg        532
Val Leu Ile Arg Gly Asn Pro Gln Leu Cys Tyr Gln Asp Met Val Leu
            160                 165                 170

tgg aag gac gtc ttc cgc aag aat aac caa ctg gct cct gtc gat ata        580
Trp Lys Asp Val Phe Arg Lys Asn Asn Gln Leu Ala Pro Val Asp Ile
            175                 180                 185

gac acc aat cgt tcc cgg gcc tgt cca cct tgt gcc ccc gcc tgc aaa        628
Asp Thr Asn Arg Ser Arg Ala Cys Pro Pro Cys Ala Pro Ala Cys Lys
    190                 195                 200

gac aat cac tgt tgg ggt gag agt ccg gaa gac tgt cag atc ttg act        676
Asp Asn His Cys Trp Gly Glu Ser Pro Glu Asp Cys Gln Ile Leu Thr
205                 210                 215                 220

ggc acc atc tgt acc agt ggt tgt gcc cgg tgc aag ggc cgg ctg ccc        724
Gly Thr Ile Cys Thr Ser Gly Cys Ala Arg Cys Lys Gly Arg Leu Pro
            225                 230                 235
```

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act gac tgc tgc cat gag cag tgt gcc gca ggc tgc acg ggc ccc aag        772
Thr Asp Cys Cys His Glu Gln Cys Ala Ala Gly Cys Thr Gly Pro Lys
            240             245             250

cat tct gac tgc ctg gcc tgc ctc cac ttc aat cat agt ggt atc tgt        820
His Ser Asp Cys Leu Ala Cys Leu His Phe Asn His Ser Gly Ile Cys
            255             260             265

gag ctg cac tgc cca gcc ctc gtc acc tac aac aca gac acc ttt gag        868
Glu Leu His Cys Pro Ala Leu Val Thr Tyr Asn Thr Asp Thr Phe Glu
            270             275             280

tcc atg cac aac cct gag ggt cgc tac acc ttt ggt gcc agc tgc gtg        916
Ser Met His Asn Pro Glu Gly Arg Tyr Thr Phe Gly Ala Ser Cys Val
285             290             295             300

acc acc tgc ccc tac aac tac ctg tct acg gaa gtg gga tcc tgc act        964
Thr Thr Cys Pro Tyr Asn Tyr Leu Ser Thr Glu Val Gly Ser Cys Thr
            305             310             315

ctg gtg tgt ccc ccg aat aac caa gag gtc aca gct gag gac gga aca       1012
Leu Val Cys Pro Pro Asn Asn Gln Glu Val Thr Ala Glu Asp Gly Thr
            320             325             330

cag cgt tgt gag aaa tgc agc aag ccc tgt gct cga gtg tgc tat ggt       1060
Gln Arg Cys Glu Lys Cys Ser Lys Pro Cys Ala Arg Val Cys Tyr Gly
            335             340             345

ctg ggc atg gag cac ctt cga ggg gcg agg gcc atc acc agt gac aat       1108
Leu Gly Met Glu His Leu Arg Gly Ala Arg Ala Ile Thr Ser Asp Asn
            350             355             360

gtc cag gag ttt gat ggc tgc aag aag atc ttt ggg agc ctg gca ttt       1156
Val Gln Glu Phe Asp Gly Cys Lys Lys Ile Phe Gly Ser Leu Ala Phe
365             370             375             380

ttg ccg gag agc ttt gat ggg gac ccc tcc tcc ggc att gct ccg ctg       1204
Leu Pro Glu Ser Phe Asp Gly Asp Pro Ser Ser Gly Ile Ala Pro Leu
            385             390             395

agg cct gag cag ctc caa gtg ttc gaa acc ctg gag gag atc aca ggt       1252
Arg Pro Glu Gln Leu Gln Val Phe Glu Thr Leu Glu Glu Ile Thr Gly
            400             405             410

tac ctg tac atc tca gca tgg cca gac agt ctc cgt gac ctc agt gtc       1300
Tyr Leu Tyr Ile Ser Ala Trp Pro Asp Ser Leu Arg Asp Leu Ser Val
            415             420             425

ttc cag aac ctt cga atc att cgg gga cgg att ctc cac gat ggc gcg       1348
Phe Gln Asn Leu Arg Ile Ile Arg Gly Arg Ile Leu His Asp Gly Ala
            430             435             440

tac tca ttg aca ctg caa ggc ctg ggg atc cac tcg ctg ggg ctg cgc       1396
Tyr Ser Leu Thr Leu Gln Gly Leu Gly Ile His Ser Leu Gly Leu Arg
445             450             455             460
```

258

```
tca ctg cgg gag ctg ggc agt gga ttg gct ctg att cac cgc aac gcc      1444
Ser Leu Arg Glu Leu Gly Ser Gly Leu Ala Leu Ile His Arg Asn Ala
            465                 470                 475

cat ctc tgc ttt gta cac act gta cct tgg gac cag ctc ttc cgg aac      1492
His Leu Cys Phe Val His Thr Val Pro Trp Asp Gln Leu Phe Arg Asn
            480                 485                 490

cca cat cag gcc ctg ctc cac agt ggg aac cgg ccg gaa gag gac ttg      1540
Pro His Gln Ala Leu Leu His Ser Gly Asn Arg Pro Glu Glu Asp Leu
            495                 500                 505

tgc gtc tcg agc ggc ttg gtc tgt aac tca ctg tgt gcc cac ggg cac      1588
Cys Val Ser Ser Gly Leu Val Cys Asn Ser Leu Cys Ala His Gly His
    510                 515                 520

tgc tgg ggg cca ggg ccc acc cag tgt gtc aac tgc agt cat ttc ctt      1636
Cys Trp Gly Pro Gly Pro Thr Gln Cys Val Asn Cys Ser His Phe Leu
525                 530                 535                 540

cgg ggc cag gag tgt gtg gag gag tgc cga gta tgg aag ggg ctc ccc      1684
Arg Gly Gln Glu Cys Val Glu Glu Cys Arg Val Trp Lys Gly Leu Pro
                545                 550                 555

cgg gag tat gtg agt gac aag cgc tgt ctg ccg tgt cac ccc gag tgt      1732
Arg Glu Tyr Val Ser Asp Lys Arg Cys Leu Pro Cys His Pro Glu Cys
            560                 565                 570

cag cct caa aac agc tca gag acc tgc ttt gga tcg gag gct gat cag      1780
Gln Pro Gln Asn Ser Ser Glu Thr Cys Phe Gly Ser Glu Ala Asp Gln
            575                 580                 585

tgt gca gcc tgc gcc cac tac aag gac tcg tcc tcc tgt gtg gct cgc      1828
Cys Ala Ala Cys Ala His Tyr Lys Asp Ser Ser Ser Cys Val Ala Arg
    590                 595                 600

tgc ccc agt ggt gtg aaa ccg gac ctc tcc tac atg ccc atc tgg aag      1876
Cys Pro Ser Gly Val Lys Pro Asp Leu Ser Tyr Met Pro Ile Trp Lys
605                 610                 615                 620

tac ccg gat gag gag ggc ata tgc cag ccg tgc ccc atc aac tgc acc      1924
Tyr Pro Asp Glu Glu Gly Ile Cys Gln Pro Cys Pro Ile Asn Cys Thr
                625                 630                 635

cac tcc tgt gtg gat ctg gat gaa cga ggc tgc cca gca gag cag aga      1972
His Ser Cys Val Asp Leu Asp Glu Arg Gly Cys Pro Ala Glu Gln Arg
            640                 645                 650

gcc agc ccg gtg aca ttc atc att gca act gta gag ggc gtc ctg ctg      2020
Ala Ser Pro Val Thr Phe Ile Ile Ala Thr Val Glu Gly Val Leu Leu
            655                 660                 665

ttc ctg atc tta gtg gtg gtc gtt gga atc cta atc aaa cga agg aga      2068
Phe Leu Ile Leu Val Val Val Val Gly Ile Leu Ile Lys Arg Arg Arg
        670                 675                 680
```

259

```
cag aag atc cgg aag tat acg atg cgt agg ctg ctg cag gaa act gag    2116
Gln Lys Ile Arg Lys Tyr Thr Met Arg Arg Leu Leu Gln Glu Thr Glu
685             690             695             700

tta gtg gag ccg ctg acg ccc agc gga gca atg ccc aac cag gct cag    2164
Leu Val Glu Pro Leu Thr Pro Ser Gly Ala Met Pro Asn Gln Ala Gln
                705             710             715

atg cgg atc cta aaa gag acg gag cta agg aag gtg aag gtg ctt gga    2212
Met Arg Ile Leu Lys Glu Thr Glu Leu Arg Lys Val Lys Val Leu Gly
            720             725             730

tca gga gct ttt ggc act gtc tac aag ggc atc tgg atc cca gat ggg    2260
Ser Gly Ala Phe Gly Thr Val Tyr Lys Gly Ile Trp Ile Pro Asp Gly
            735             740             745

gag aat gtg aaa atc ccc gtg gct atc aag gtg ttg aga gaa aac aca    2308
Glu Asn Val Lys Ile Pro Val Ala Ile Lys Val Leu Arg Glu Asn Thr
            750             755             760

tct cct aaa gcc aac aaa gaa att cta gat gaa gcg tat gtg atg gct    2356
Ser Pro Lys Ala Asn Lys Glu Ile Leu Asp Glu Ala Tyr Val Met Ala
765             770             775             780

ggt gtg ggt tct ccg tat gtg tcc cgc ctc ctg ggc atc tgc ctg aca    2404
Gly Val Gly Ser Pro Tyr Val Ser Arg Leu Leu Gly Ile Cys Leu Thr
                785             790             795

tcc aca gta cag ctg gtg aca cag ctt atg ccc tac ggc tgc ctt ctg    2452
Ser Thr Val Gln Leu Val Thr Gln Leu Met Pro Tyr Gly Cys Leu Leu
                800             805             810

gac cat gtc cga gaa cac cga ggt cgc cta ggc tcc cag gac ctg ctc    2500
Asp His Val Arg Glu His Arg Gly Arg Leu Gly Ser Gln Asp Leu Leu
            815             820             825

aac tgg tgt gtt cag att gcc aag ggg atg agc tac ctg gag gac gtg    2548
Asn Trp Cys Val Gln Ile Ala Lys Gly Met Ser Tyr Leu Glu Asp Val
    830             835             840

cgg ctt gta cac agg gac ctg gct gcc cgg aat gtg cta gtc aag agt    2596
Arg Leu Val His Arg Asp Leu Ala Ala Arg Asn Val Leu Val Lys Ser
845             850             855             860

ccc aac cac gtc aag att aca gat ttc ggg ctg gct cgg ctg ctg gac    2644
Pro Asn His Val Lys Ile Thr Asp Phe Gly Leu Ala Arg Leu Leu Asp
                865             870             875

att gat gag aca gag tac cat gca gat ggg ggc aag gtg ccc atc aaa    2692
Ile Asp Glu Thr Glu Tyr His Ala Asp Gly Gly Lys Val Pro Ile Lys
                880             885             890

tgg atg gca ttg gaa tct att ctc aga cgc cgg ttc acc cat cag agt    2740
Trp Met Ala Leu Glu Ser Ile Leu Arg Arg Arg Phe Thr His Gln Ser
            895             900             905
```

260

```
gat gtg tgg agc tat gga gtg act gtg tgg gag ctg atg act ttt ggg          2788
Asp Val Trp Ser Tyr Gly Val Thr Val Trp Glu Leu Met Thr Phe Gly
    910             915             920


gcc aaa cct tac gat gga atc cca gcc cgg gag atc cct gat ttg ctg          2836
Ala Lys Pro Tyr Asp Gly Ile Pro Ala Arg Glu Ile Pro Asp Leu Leu
925             930             935             940


gag aag gga gaa cgc cta cct cag cct cca atc tgc acc att gat gtc          2884
Glu Lys Gly Glu Arg Leu Pro Gln Pro Pro Ile Cys Thr Ile Asp Val
            945             950             955


tac atg att atg gtc aaa tgt tgg atg att gac tct gaa tgt cgc ccg          2932
Tyr Met Ile Met Val Lys Cys Trp Met Ile Asp Ser Glu Cys Arg Pro
            960             965             970


aga ttc cgg gag ttg gtg tca gaa ttt tca cgt atg gcg agg gac ccc          2980
Arg Phe Arg Glu Leu Val Ser Glu Phe Ser Arg Met Ala Arg Asp Pro
        975             980             985


cag cgt ttt gtg gtc atc cag aac gag gac ttg ggc  cca tcc agc ccc         3028
Gln Arg Phe Val Val Ile Gln Asn Glu Asp Leu Gly  Pro Ser Ser Pro
    990             995             1000


atg  gac agt acc ttc tac  cgt tca ctg ctg gaa  gat gat gac atg          3073
Met  Asp Ser Thr Phe Tyr  Arg Ser Leu Leu Glu  Asp Asp Asp Met
1005             1010            1015


ggt  gac ctg gta gac gct  gaa gag tat ctg gtg  ccc cag cag gga          3118
Gly  Asp Leu Val Asp Ala  Glu Glu Tyr Leu Val  Pro Gln Gln Gly
1020             1025            1030


ttc  ttc tcc ccg gac cct  acc cca ggc act ggg  agc aca gcc cat          3163
Phe  Phe Ser Pro Asp Pro  Thr Pro Gly Thr Gly  Ser Thr Ala His
1035             1040            1045


aga  agg cac cgc agc tcg  tcc acc agg agt gga  ggt ggt gag ctg          3208
Arg  Arg His Arg Ser Ser  Ser Thr Arg Ser Gly  Gly Gly Glu Leu
1050             1055            1060


aca  ctg ggc ctg gag ccc  tcg gaa gaa ggg ccc  ccc aga tct cca          3253
Thr  Leu Gly Leu Glu Pro  Ser Glu Glu Gly Pro  Pro Arg Ser Pro
1065             1070            1075


ctg  gct ccc tcg gaa ggg  gct ggc tcc gat gtg  ttt gat ggt gac          3298
Leu  Ala Pro Ser Glu Gly  Ala Gly Ser Asp Val  Phe Asp Gly Asp
1080             1085            1090


ctg  gca atg ggg gta acc  aaa ggg ctg cag agc  ctc tct cca cat          3343
Leu  Ala Met Gly Val Thr  Lys Gly Leu Gln Ser  Leu Ser Pro His
1095             1100            1105


gac  ctc agc cct cta cag  cgg tac agc gag gac  ccc aca tta cct          3388
Asp  Leu Ser Pro Leu Gln  Arg Tyr Ser Glu Asp  Pro Thr Leu Pro
1110             1115            1120
```

261

```
ctg  ccc ccc gag act gat  ggc tat gtt gct ccc  ctg gcc tgc agc    3433
Leu  Pro Pro Glu Thr Asp  Gly Tyr Val Ala Pro  Leu Ala Cys Ser
1125                 1130                 1135

ccc  cag ccc gag tat gtg  aac caa tca gag gtt  cag cct cag cct    3478
Pro  Gln Pro Glu Tyr Val  Asn Gln Ser Glu Val  Gln Pro Gln Pro
1140                 1145                 1150

cct  tta acc cca gag ggt  cct ctg cct cct gtc  cgg cct gct ggt    3523
Pro  Leu Thr Pro Glu Gly  Pro Leu Pro Pro Val  Arg Pro Ala Gly
1155                 1160                 1165

gct  act cta gaa aga ccc  aag act ctc tct cct  ggg aag aat ggg    3568
Ala  Thr Leu Glu Arg Pro  Lys Thr Leu Ser Pro  Gly Lys Asn Gly
1170                 1175                 1180

gtt  gtc aaa gac gtt ttt  gcc ttc ggg ggt gct  gtg gag aac cct    3613
Val  Val Lys Asp Val Phe  Ala Phe Gly Gly Ala  Val Glu Asn Pro
1185                 1190                 1195

gaa  tac tta gta ccg aga  gaa ggc act gcc tct  ccg ccc cac cct    3658
Glu  Tyr Leu Val Pro Arg  Glu Gly Thr Ala Ser  Pro Pro His Pro
1200                 1205                 1210

tct  cct gcc ttc agc cca  gcc ttt gac aac ctc  tat tac tgg gac    3703
Ser  Pro Ala Phe Ser Pro  Ala Phe Asp Asn Leu  Tyr Tyr Trp Asp
1215                 1220                 1225

cag  aac tca tcg gag cag  ggg cct cca cca agt  aac ttt gaa ggg    3748
Gln  Asn Ser Ser Glu Gln  Gly Pro Pro Pro Ser  Asn Phe Glu Gly
1230                 1235                 1240

acc  ccc act gca gag aac  cct gag tac cta ggc  ctg gat gta cct    3793
Thr  Pro Thr Ala Glu Asn  Pro Glu Tyr Leu Gly  Leu Asp Val Pro
1245                 1250                 1255

gta  tga gacgtgtgca gacgtcctgt gctttcagag tggggaaggc ctgacttgtg    3849
Val
1260


gtctccatcg ccacaaagca gggagagggt cctctggcca cattacatcc agggcagacg    3909

gctctaccag gaacctgccc cgaggaacct ttccttgctg cttgaa                  3955
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Met Ile Ile Met Glu Leu Ala Ala Trp Cys Arg Trp Gly Phe Leu Leu
1               5                   10                  15
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262

Ala Leu Leu Pro Pro Gly Ile Ala Gly Thr Gln Val Cys Thr Gly Thr
20   25   30

Asp Met Lys Leu Arg Leu Pro Ala Ser Pro Glu Thr His Leu Asp Met
35   40   45

Leu Arg His Leu Tyr Gln Gly Cys Gln Val Val Gln Gly Asn Leu Glu
50   55   60

Leu Thr Tyr Val Pro Ala Asn Ala Ser Leu Ser Phe Leu Gln Asp Ile
65   70   75   80

Gln Glu Val Gln Gly Tyr Met Leu Ile Ala His Asn Gln Val Lys Arg
85   90   95

Val Pro Leu Gln Arg Leu Arg Ile Val Arg Gly Thr Gln Leu Phe Glu
100   105   110

Asp Lys Tyr Ala Leu Ala Val Leu Asp Asn Arg Asp Pro Gln Asp Asn
115   120   125

Val Ala Ala Ser Thr Pro Gly Arg Thr Pro Glu Gly Leu Arg Glu Leu
130   135   140

Gln Leu Arg Ser Leu Thr Glu Ile Leu Lys Gly Gly Val Leu Ile Arg
145   150   155   160

Gly Asn Pro Gln Leu Cys Tyr Gln Asp Met Val Leu Trp Lys Asp Val
165   170   175

Phe Arg Lys Asn Asn Gln Leu Ala Pro Val Asp Ile Asp Thr Asn Arg
180   185   190

Ser Arg Ala Cys Pro Pro Cys Ala Pro Ala Cys Lys Asp Asn His Cys
195   200   205

Trp Gly Glu Ser Pro Glu Asp Cys Gln Ile Leu Thr Gly Thr Ile Cys
210   215   220

Thr Ser Gly Cys Ala Arg Cys Lys Gly Arg Leu Pro Thr Asp Cys Cys
225   230   235   240

263

```
His Glu Gln Cys Ala Ala Gly Cys Thr Gly Pro Lys His Ser Asp Cys
                245                 250                 255

Leu Ala Cys Leu His Phe Asn His Ser Gly Ile Cys Glu Leu His Cys
                260                 265                 270

Pro Ala Leu Val Thr Tyr Asn Thr Asp Thr Phe Glu Ser Met His Asn
                275                 280                 285

Pro Glu Gly Arg Tyr Thr Phe Gly Ala Ser Cys Val Thr Thr Cys Pro
            290                 295                 300

Tyr Asn Tyr Leu Ser Thr Glu Val Gly Ser Cys Thr Leu Val Cys Pro
305                 310                 315                 320

Pro Asn Asn Gln Glu Val Thr Ala Glu Asp Gly Thr Gln Arg Cys Glu
                325                 330                 335

Lys Cys Ser Lys Pro Cys Ala Arg Val Cys Tyr Gly Leu Gly Met Glu
            340                 345                 350

His Leu Arg Gly Ala Arg Ala Ile Thr Ser Asp Asn Val Gln Glu Phe
            355                 360                 365

Asp Gly Cys Lys Lys Ile Phe Gly Ser Leu Ala Phe Leu Pro Glu Ser
    370                 375                 380

Phe Asp Gly Asp Pro Ser Ser Gly Ile Ala Pro Leu Arg Pro Glu Gln
385                 390                 395                 400

Leu Gln Val Phe Glu Thr Leu Glu Glu Ile Thr Gly Tyr Leu Tyr Ile
                405                 410                 415

Ser Ala Trp Pro Asp Ser Leu Arg Asp Leu Ser Val Phe Gln Asn Leu
            420                 425                 430

Arg Ile Ile Arg Gly Arg Ile Leu His Asp Gly Ala Tyr Ser Leu Thr
            435                 440                 445

Leu Gln Gly Leu Gly Ile His Ser Leu Gly Leu Arg Ser Leu Arg Glu
    450                 455                 460
```

264

Leu Gly Ser Gly Leu Ala Leu Ile His Arg Asn Ala His Leu Cys Phe
465   470   475   480

Val His Thr Val Pro Trp Asp Gln Leu Phe Arg Asn Pro His Gln Ala
            485   490   495

Leu Leu His Ser Gly Asn Arg Pro Glu Glu Asp Leu Cys Val Ser Ser
        500   505   510

Gly Leu Val Cys Asn Ser Leu Cys Ala His Gly His Cys Trp Gly Pro
        515   520   525

Gly Pro Thr Gln Cys Val Asn Cys Ser His Phe Leu Arg Gly Gln Glu
    530   535   540

Cys Val Glu Glu Cys Arg Val Trp Lys Gly Leu Pro Arg Glu Tyr Val
545   550   555   560

Ser Asp Lys Arg Cys Leu Pro Cys His Pro Glu Cys Gln Pro Gln Asn
            565   570   575

Ser Ser Glu Thr Cys Phe Gly Ser Glu Ala Asp Gln Cys Ala Ala Cys
        580   585   590

Ala His Tyr Lys Asp Ser Ser Ser Cys Val Ala Arg Cys Pro Ser Gly
        595   600   605

Val Lys Pro Asp Leu Ser Tyr Met Pro Ile Trp Lys Tyr Pro Asp Glu
    610   615   620

Glu Gly Ile Cys Gln Pro Cys Pro Ile Asn Cys Thr His Ser Cys Val
625   630   635   640

Asp Leu Asp Glu Arg Gly Cys Pro Ala Glu Gln Arg Ala Ser Pro Val
            645   650   655

Thr Phe Ile Ile Ala Thr Val Glu Gly Val Leu Leu Phe Leu Ile Leu
        660   665   670

Val Val Val Val Gly Ile Leu Ile Lys Arg Arg Arg Gln Lys Ile Arg
    675   680   685

265

Lys Tyr Thr Met Arg Arg Leu Leu Gln Glu Thr Glu Leu Val Glu Pro
690   695   700

Leu Thr Pro Ser Gly Ala Met Pro Asn Gln Ala Gln Met Arg Ile Leu
705   710   715   720

Lys Glu Thr Glu Leu Arg Lys Val Lys Val Leu Gly Ser Gly Ala Phe
                725   730   735

Gly Thr Val Tyr Lys Gly Ile Trp Ile Pro Asp Gly Glu Asn Val Lys
            740   745   750

Ile Pro Val Ala Ile Lys Val Leu Arg Glu Asn Thr Ser Pro Lys Ala
        755   760   765

Asn Lys Glu Ile Leu Asp Glu Ala Tyr Val Met Ala Gly Val Gly Ser
    770   775   780

Pro Tyr Val Ser Arg Leu Leu Gly Ile Cys Leu Thr Ser Thr Val Gln
785   790   795   800

Leu Val Thr Gln Leu Met Pro Tyr Gly Cys Leu Leu Asp His Val Arg
            805   810   815

Glu His Arg Gly Arg Leu Gly Ser Gln Asp Leu Leu Asn Trp Cys Val
        820   825   830

Gln Ile Ala Lys Gly Met Ser Tyr Leu Glu Asp Val Arg Leu Val His
    835   840   845

Arg Asp Leu Ala Ala Arg Asn Val Leu Val Lys Ser Pro Asn His Val
    850   855   860

Lys Ile Thr Asp Phe Gly Leu Ala Arg Leu Leu Asp Ile Asp Glu Thr
865   870   875   880

Glu Tyr His Ala Asp Gly Gly Lys Val Pro Ile Lys Trp Met Ala Leu
            885   890   895

Glu Ser Ile Leu Arg Arg Arg Phe Thr His Gln Ser Asp Val Trp Ser
        900   905   910

266

```
Tyr Gly Val Thr Val Trp Glu Leu Met Thr Phe Gly Ala Lys Pro Tyr
        915         920             925

Asp Gly Ile Pro Ala Arg Glu Ile Pro Asp Leu Leu Glu Lys Gly Glu
        930         935             940

Arg Leu Pro Gln Pro Pro Ile Cys Thr Ile Asp Val Tyr Met Ile Met
945         950             955             960

Val Lys Cys Trp Met Ile Asp Ser Glu Cys Arg Pro Arg Phe Arg Glu
            965             970             975

Leu Val Ser Glu Phe Ser Arg Met Ala Arg Asp Pro Gln Arg Phe Val
        980             985             990

Val Ile Gln Asn Glu Asp Leu Gly  Pro Ser Ser Pro Met  Asp Ser Thr
        995             1000            1005

Phe Tyr  Arg Ser Leu Leu Glu  Asp Asp Asp Met Gly  Asp Leu Val
    1010            1015            1020

Asp Ala  Glu Glu Tyr Leu Val  Pro Gln Gln Gly Phe  Phe Ser Pro
    1025            1030            1035

Asp Pro  Thr Pro Gly Thr Gly  Ser Thr Ala His Arg  Arg His Arg
    1040            1045            1050

Ser Ser  Ser Thr Arg Ser Gly  Gly Gly Glu Leu Thr  Leu Gly Leu
    1055            1060            1065

Glu Pro  Ser Glu Glu Gly Pro  Pro Arg Ser Pro Leu  Ala Pro Ser
    1070            1075            1080

Glu Gly  Ala Gly Ser Asp Val  Phe Asp Gly Asp Leu  Ala Met Gly
    1085            1090            1095

Val Thr  Lys Gly Leu Gln Ser  Leu Ser Pro His Asp  Leu Ser Pro
    1100            1105            1110

Leu Gln  Arg Tyr Ser Glu Asp  Pro Thr Leu Pro Leu  Pro Pro Glu
    1115            1120            1125
```

267

```
Thr Asp  Gly Tyr Val Ala Pro  Leu Ala Cys Ser Pro  Gln Pro Glu
    1130              1135              1140

Tyr Val  Asn Gln Ser Glu Val  Gln Pro Gln Pro Pro  Leu Thr Pro
    1145              1150              1155

Glu Gly  Pro Leu Pro Pro Val  Arg Pro Ala Gly Ala  Thr Leu Glu
    1160              1165              1170

Arg Pro  Lys Thr Leu Ser Pro  Gly Lys Asn Gly Val  Val Lys Asp
    1175              1180              1185

Val Phe  Ala Phe Gly Gly Ala  Val Glu Asn Pro Glu  Tyr Leu Val
    1190              1195              1200

Pro Arg  Glu Gly Thr Ala Ser  Pro Pro His Pro Ser  Pro Ala Phe
    1205              1210              1215

Ser Pro  Ala Phe Asp Asn Leu  Tyr Tyr Trp Asp Gln  Asn Ser Ser
    1220              1225              1230

Glu Gln  Gly Pro Pro Pro Ser  Asn Phe Glu Gly Thr  Pro Thr Ala
    1235              1240              1245

Glu Asn  Pro Glu Tyr Leu Gly  Leu Asp Val Pro Val
    1250              1255              1260
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                                              Met Lys Ser Gly
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tcc gga gga ggg tcc ccg acc tcg ctg tgg ggg ctc ctg ttt ctc tcc     105
Ser Gly Gly Gly Ser Pro Thr Ser Leu Trp Gly Leu Leu Phe Leu Ser
5                   10                  15                  20
```

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gcc gcg ctc tcg ctc tgg ccg acg agt gga gaa atc tgc ggg cca ggc       153
Ala Ala Leu Ser Leu Trp Pro Thr Ser Gly Glu Ile Cys Gly Pro Gly
            25              30              35

atc gac atc cgc aac gac tat cag cag ctg aag cgc ctg gag aac tgc       201
Ile Asp Ile Arg Asn Asp Tyr Gln Gln Leu Lys Arg Leu Glu Asn Cys
            40              45              50

acg gtg atc gag ggc tac ctc cac atc ctg ctc atc tcc aag gcc gag       249
Thr Val Ile Glu Gly Tyr Leu His Ile Leu Leu Ile Ser Lys Ala Glu
            55              60              65

gac tac cgc agc tac cgc ttc ccc aag ctc acg gtc att acc gag tac       297
Asp Tyr Arg Ser Tyr Arg Phe Pro Lys Leu Thr Val Ile Thr Glu Tyr
            70              75              80

ttg ctg ctg ttc cga gtg gct ggc ctc gag agc ctc gga gac ctc ttc       345
Leu Leu Leu Phe Arg Val Ala Gly Leu Glu Ser Leu Gly Asp Leu Phe
85              90              95              100

ccc aac ctc acg gtc atc cgc ggc tgg aaa ctc ttc tac aac tac gcc       393
Pro Asn Leu Thr Val Ile Arg Gly Trp Lys Leu Phe Tyr Asn Tyr Ala
            105             110             115

ctg gtc atc ttc gag atg acc aat ctc aag gat att ggg ctt tac aac       441
Leu Val Ile Phe Glu Met Thr Asn Leu Lys Asp Ile Gly Leu Tyr Asn
            120             125             130

ctg agg aac att act cgg ggg gcc atc agg att gag aaa aat gct gac       489
Leu Arg Asn Ile Thr Arg Gly Ala Ile Arg Ile Glu Lys Asn Ala Asp
            135             140             145

ctc tgt tac ctc tcc act gtg gac tgg tcc ctg atc ctg gat gcg gtg       537
Leu Cys Tyr Leu Ser Thr Val Asp Trp Ser Leu Ile Leu Asp Ala Val
            150             155             160

tcc aat aac tac att gtg ggg aat aag ccc cca aag gaa tgt ggg gac       585
Ser Asn Asn Tyr Ile Val Gly Asn Lys Pro Pro Lys Glu Cys Gly Asp
165             170             175             180

ctg tgt cca ggg acc atg gag gag aag ccg atg tgt gag aag acc acc       633
Leu Cys Pro Gly Thr Met Glu Glu Lys Pro Met Cys Glu Lys Thr Thr
            185             190             195

atc aac aat gag tac aac tac cgc tgc tgg acc aca aac cgc tgc cag       681
Ile Asn Asn Glu Tyr Asn Tyr Arg Cys Trp Thr Thr Asn Arg Cys Gln
            200             205             210

aaa atg tgc cca agc acg tgt ggg aag cgg gcg tgc acc gag aac aat       729
Lys Met Cys Pro Ser Thr Cys Gly Lys Arg Ala Cys Thr Glu Asn Asn
            215             220             225

gag tgc tgc cac ccc gag tgc ctg ggc agc tgc agc gcg cct gac aac       777
Glu Cys Cys His Pro Glu Cys Leu Gly Ser Cys Ser Ala Pro Asp Asn
            230             235             240
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269

```
gac acg gcc tgt gta gct tgc cgc cac tac tac tat gcc ggt gtc tgt     825
Asp Thr Ala Cys Val Ala Cys Arg His Tyr Tyr Tyr Ala Gly Val Cys
245             250             255             260

gtg cct gcc tgc ccg ccc aac acc tac agg ttt gag ggc tgg cgc tgt     873
Val Pro Ala Cys Pro Pro Asn Thr Tyr Arg Phe Glu Gly Trp Arg Cys
            265             270             275

gtg gac cgt gac ttc tgc gcc aac atc ctc agc gcc gag agc agc gac     921
Val Asp Arg Asp Phe Cys Ala Asn Ile Leu Ser Ala Glu Ser Ser Asp
            280             285             290

tcc gag ggg ttt gtg atc cac gac ggc gag tgc atg cag gag tgc ccc     969
Ser Glu Gly Phe Val Ile His Asp Gly Glu Cys Met Gln Glu Cys Pro
        295             300             305

tcg ggc ttc atc cgc aac ggc agc cag agc atg tac tgc atc cct tgt    1017
Ser Gly Phe Ile Arg Asn Gly Ser Gln Ser Met Tyr Cys Ile Pro Cys
        310             315             320

gaa ggt cct tgc ccg aag gtc tgt gag gaa gaa aag aaa aca aag acc    1065
Glu Gly Pro Cys Pro Lys Val Cys Glu Glu Glu Lys Lys Thr Lys Thr
325             330             335             340

att gat tct gtt act tct gct cag atg ctc caa gga tgc acc atc ttc    1113
Ile Asp Ser Val Thr Ser Ala Gln Met Leu Gln Gly Cys Thr Ile Phe
            345             350             355

aag ggc aat ttg ctc att aac atc cga cgg ggg aat aac att gct tca    1161
Lys Gly Asn Leu Leu Ile Asn Ile Arg Arg Gly Asn Asn Ile Ala Ser
        360             365             370

gag ctg gag aac ttc atg ggg ctc atc gag gtg gtg acg ggc tac gtg    1209
Glu Leu Glu Asn Phe Met Gly Leu Ile Glu Val Val Thr Gly Tyr Val
        375             380             385

aag atc cgc cat tct cat gcc ttg gtc tcc ttg tcc ttc cta aaa aac    1257
Lys Ile Arg His Ser His Ala Leu Val Ser Leu Ser Phe Leu Lys Asn
        390             395             400

ctt cgc ctc atc cta gga gag gag cag cta gaa ggg aat tac tcc ttc    1305
Leu Arg Leu Ile Leu Gly Glu Glu Gln Leu Glu Gly Asn Tyr Ser Phe
405             410             415             420

tac gtc ctc gac aac cag aac ttg cag caa ctg tgg gac tgg gac cac    1353
Tyr Val Leu Asp Asn Gln Asn Leu Gln Gln Leu Trp Asp Trp Asp His
            425             430             435

cgc aac ctg acc atc aaa gca ggg aaa atg tac ttt gct ttc aat ccc    1401
Arg Asn Leu Thr Ile Lys Ala Gly Lys Met Tyr Phe Ala Phe Asn Pro
            440             445             450

aaa tta tgt gtt tcc gaa att tac cgc atg gag gaa gtg acg ggg act    1449
Lys Leu Cys Val Ser Glu Ile Tyr Arg Met Glu Glu Val Thr Gly Thr
        455             460             465
```

270

```
aaa ggg cgc caa agc aaa ggg gac ata aac acc agg aac aac ggg gag    1497
Lys Gly Arg Gln Ser Lys Gly Asp Ile Asn Thr Arg Asn Asn Gly Glu
    470             475             480

aga gcc tcc tgt gaa agt gac gtc ctg cat ttc acc tcc acc acc acg    1545
Arg Ala Ser Cys Glu Ser Asp Val Leu His Phe Thr Ser Thr Thr Thr
485             490             495             500

tcg aag aat cgc atc atc ata acc tgg cac cgg tac cgg ccc cct gac    1593
Ser Lys Asn Arg Ile Ile Ile Thr Trp His Arg Tyr Arg Pro Pro Asp
            505             510             515

tac agg gat ctc atc agc ttc acc gtt tac tac aag gaa gca ccc ttt    1641
Tyr Arg Asp Leu Ile Ser Phe Thr Val Tyr Tyr Lys Glu Ala Pro Phe
            520             525             530

aag aat gtc aca gag tat gat ggg cag gat gcc tgc ggc tcc aac agc    1689
Lys Asn Val Thr Glu Tyr Asp Gly Gln Asp Ala Cys Gly Ser Asn Ser
        535             540             545

tgg aac atg gtg gac gtg gac ctc ccg ccc aac aag gac gtg gag ccc    1737
Trp Asn Met Val Asp Val Asp Leu Pro Pro Asn Lys Asp Val Glu Pro
    550             555             560

ggc atc tta cta cat ggg ctg aag ccc tgg act cag tac gcc gtt tac    1785
Gly Ile Leu Leu His Gly Leu Lys Pro Trp Thr Gln Tyr Ala Val Tyr
565             570             575             580

gtc aag gct gtg acc ctc acc atg gtg gag aac gac cat atc cgt ggg    1833
Val Lys Ala Val Thr Leu Thr Met Val Glu Asn Asp His Ile Arg Gly
            585             590             595

gcc aag agt gag atc ttg tac att cgc acc aat gct tca gtt cct tcc    1881
Ala Lys Ser Glu Ile Leu Tyr Ile Arg Thr Asn Ala Ser Val Pro Ser
            600             605             610

att ccc ttg gac gtt ctt tca gca tcg aac tcc tct tct cag tta atc    1929
Ile Pro Leu Asp Val Leu Ser Ala Ser Asn Ser Ser Ser Gln Leu Ile
            615             620             625

gtg aag tgg aac cct ccc tct ctg ccc aac ggc aac ctg agt tac tac    1977
Val Lys Trp Asn Pro Pro Ser Leu Pro Asn Gly Asn Leu Ser Tyr Tyr
630'            635             640

att gtg cgc tgg cag cgg cag cct cag gac ggc tac ctt tac cgg cac    2025
Ile Val Arg Trp Gln Arg Gln Pro Gln Asp Gly Tyr Leu Tyr Arg His
645             650             655             660

aat tac tgc tcc aaa gac aaa atc ccc atc agg aag tat gcc gac ggc    2073
Asn Tyr Cys Ser Lys Asp Lys Ile Pro Ile Arg Lys Tyr Ala Asp Gly
            665             670             675

acc atc gac att gag gag gtc aca gag aac ccc aag act gag gtg tgt    2121
Thr Ile Asp Ile Glu Glu Val Thr Glu Asn Pro Lys Thr Glu Val Cys
            680             685             690
```

271

```
ggt ggg gag aaa ggg cct tgc tgc gcc tgc ccc aaa act gaa gcc gag        2169
Gly Gly Glu Lys Gly Pro Cys Cys Ala Cys Pro Lys Thr Glu Ala Glu
        695             700             705

aag cag gcc gag aag gag gag gct gaa tac cgc aaa gtc ttt gag aat        2217
Lys Gln Ala Glu Lys Glu Glu Ala Glu Tyr Arg Lys Val Phe Glu Asn
        710             715             720

ttc ctg cac aac tcc atc ttc gtg ccc aga cct gaa agg aag cgg aga        2265
Phe Leu His Asn Ser Ile Phe Val Pro Arg Pro Glu Arg Lys Arg Arg
725             730             735             740

gat gtc atg caa gtg gcc aac acc acc atg tcc agc cga agc agg aac        2313
Asp Val Met Gln Val Ala Asn Thr Thr Met Ser Ser Arg Ser Arg Asn
            745             750             755

acc acg gcc gca gac acc tac aac atc acc gac ccg gaa gag ctg gag        2361
Thr Thr Ala Ala Asp Thr Tyr Asn Ile Thr Asp Pro Glu Glu Leu Glu
            760             765             770

aca gag tac cct ttc ttt gag agc aga gtg gat aac aag gag aga act        2409
Thr Glu Tyr Pro Phe Phe Glu Ser Arg Val Asp Asn Lys Glu Arg Thr
            775             780             785

gtc att tct aac ctt cgg cct ttc aca ttg tac cgc atc gat atc cac        2457
Val Ile Ser Asn Leu Arg Pro Phe Thr Leu Tyr Arg Ile Asp Ile His
        790             795             800

agc tgc aac cac gag gct gag aag ctg ggc tgc agc gcc tcc aac ttc        2505
Ser Cys Asn His Glu Ala Glu Lys Leu Gly Cys Ser Ala Ser Asn Phe
805             810             815             820

gtc ttt gca agg act atg ccc gca gaa gga gca gat gac att cct ggg        2553
Val Phe Ala Arg Thr Met Pro Ala Glu Gly Ala Asp Asp Ile Pro Gly
            825             830             835

cca gtg acc tgg gag cca agg cct gaa aac tcc atc ttt tta aag tgg        2601
Pro Val Thr Trp Glu Pro Arg Pro Glu Asn Ser Ile Phe Leu Lys Trp
            840             845             850

ccg gaa cct gag aat ccc aat gga ttg att cta atg tat gaa ata aaa        2649
Pro Glu Pro Glu Asn Pro Asn Gly Leu Ile Leu Met Tyr Glu Ile Lys
        855             860             865

tac gga tca caa gtt gag gat cag cga gaa tgt gtg tcc aga cag gaa        2697
Tyr Gly Ser Gln Val Glu Asp Gln Arg Glu Cys Val Ser Arg Gln Glu
        870             875             880

tac agg aag tat gga ggg gcc aag cta aac cgg cta aac ccg ggg aac        2745
Tyr Arg Lys Tyr Gly Gly Ala Lys Leu Asn Arg Leu Asn Pro Gly Asn
885             890             895             900

tac aca gcc cgg att cag gcc aca tct ctc tct ggg aat ggg tcg tgg        2793
Tyr Thr Ala Arg Ile Gln Ala Thr Ser Leu Ser Gly Asn Gly Ser Trp
            905             910             915
```

```
aca gat cct gtg ttc ttc tat gtc cag gcc aaa aca gga tat gaa aac    2841
Thr Asp Pro Val Phe Phe Tyr Val Gln Ala Lys Thr Gly Tyr Glu Asn
        920             925             930

ttc atc cat ctg atc atc gct ctg ccc gtc gct gtc ctg ttg atc gtg    2889
Phe Ile His Leu Ile Ile Ala Leu Pro Val Ala Val Leu Leu Ile Val
        935             940             945

gga ggg ttg gtg att atg ctg tac gtc ttc cat aga aag aga aat aac    2937
Gly Gly Leu Val Ile Met Leu Tyr Val Phe His Arg Lys Arg Asn Asn
        950             955             960

agc agg ctg ggg aat gga gtg ctg tat gcc tct gtg aac ccg gag tac    2985
Ser Arg Leu Gly Asn Gly Val Leu Tyr Ala Ser Val Asn Pro Glu Tyr
965             970             975             980

ttc agc gct gct gat gtg tac gtt cct gat gag tgg gag gtg gct cgg    3033
Phe Ser Ala Ala Asp Val Tyr Val Pro Asp Glu Trp Glu Val Ala Arg
        985             990             995

gag aag atc acc  atg agc cgg gaa ctt  ggg cag ggg tcg ttt  ggg     3078
Glu Lys Ile Thr  Met Ser Arg Glu Leu  Gly Gln Gly Ser Phe  Gly
        1000            1005            1010

atg gtc tat gaa  gga gtt gcc aag ggt  gtg gtg aaa gat gaa  cct     3123
Met Val Tyr Glu  Gly Val Ala Lys Gly  Val Val Lys Asp Glu  Pro
        1015            1020            1025

gaa acc aga gtg  gcc att aaa aca gtg  aac gag gcc gca agc  atg     3168
Glu Thr Arg Val  Ala Ile Lys Thr Val  Asn Glu Ala Ala Ser  Met
        1030            1035            1040

cgt gag agg att  gag ttt ctc aac gaa  gct tct gtg atg aag  gag     3213
Arg Glu Arg Ile  Glu Phe Leu Asn Glu  Ala Ser Val Met Lys  Glu
        1045            1050            1055

ttc aat tgt cac  cat gtg gtg cga ttg  ctg ggt gtg gtg tcc  caa     3258
Phe Asn Cys His  His Val Val Arg Leu  Leu Gly Val Val Ser  Gln
        1060            1065            1070

ggc cag cca aca  ctg gtc atc atg gaa  ctg atg aca cgg ggc  gat     3303
Gly Gln Pro Thr  Leu Val Ile Met Glu  Leu Met Thr Arg Gly  Asp
        1075            1080            1085

ctc aaa agt tat  ctc cgg tct ctg agg  cca gaa atg gag aat  aat     3348
Leu Lys Ser Tyr  Leu Arg Ser Leu Arg  Pro Glu Met Glu Asn  Asn
        1090            1095            1100

cca gtc cta gca  cct cca agc ctg agc  aag atg att cag atg  gcc     3393
Pro Val Leu Ala  Pro Pro Ser Leu Ser  Lys Met Ile Gln Met  Ala
        1105            1110            1115

gga gag att gca  gac ggc atg gca tac  ctc aac gcc aat aag  ttc     3438
Gly Glu Ile Ala  Asp Gly Met Ala Tyr  Leu Asn Ala Asn Lys  Phe
        1120            1125            1130
```

273

```
gtc cac aga gac   ctt gct gcc cgg   aat tgc atg gta gcc gaa   gat      3483
Val His Arg Asp   Leu Ala Ala Arg   Asn Cys Met Val Ala Glu   Asp
        1135                  1140                  1145

ttc aca gtc aaa   atc gga gat ttt   ggt atg acg cga gat atc   tat      3528
Phe Thr Val Lys   Ile Gly Asp Phe   Gly Met Thr Arg Asp Ile   Tyr
        1150                  1155                  1160

gag aca gac tat   tac cgg aaa gga   ggc aaa ggg ctg ctg ccc   gtg      3573
Glu Thr Asp Tyr   Tyr Arg Lys Gly   Gly Lys Gly Leu Leu Pro   Val
        1165                  1170                  1175

cgc tgg atg tct   cct gag tcc ctc   aag gat gga gtc ttc acc   act      3618
Arg Trp Met Ser   Pro Glu Ser Leu   Lys Asp Gly Val Phe Thr   Thr
        1180                  1185                  1190

tac tcg gac gtc   tgg tcc ttc ggg   gtc gtc ctc tgg gag atc   gcc      3663
Tyr Ser Asp Val   Trp Ser Phe Gly   Val Val Leu Trp Glu Ile   Ala
        1195                  1200                  1205

aca ctg gcc gag   cag ccc tac cag   ggc ttg tcc aac gag caa   gtc      3708
Thr Leu Ala Glu   Gln Pro Tyr Gln   Gly Leu Ser Asn Glu Gln   Val
        1210                  1215                  1220

ctt cgc ttc gtc   atg gag ggc ggc   ctt ctg gac aag cca gac   aac      3753
Leu Arg Phe Val   Met Glu Gly Gly   Leu Leu Asp Lys Pro Asp   Asn
        1225                  1230                  1235

tgt cct gac atg   ctg ttt gaa ctg   atg cgc atg tgc tgg cag   tat      3798
Cys Pro Asp Met   Leu Phe Glu Leu   Met Arg Met Cys Trp Gln   Tyr
        1240                  1245                  1250

aac ccc aag atg   agg cct tcc ttc   ctg gag atc atc agc agc   atc      3843
Asn Pro Lys Met   Arg Pro Ser Phe   Leu Glu Ile Ile Ser Ser   Ile
        1255                  1260                  1265

aaa gag gag atg   gag cct ggc ttc   cgg gag gtc tcc ttc tac   tac      3888
Lys Glu Glu Met   Glu Pro Gly Phe   Arg Glu Val Ser Phe Tyr   Tyr
        1270                  1275                  1280

agc gag gag aac   aag ctg ccc gag   ccg gag gag ctg gac ctg   gag      3933
Ser Glu Glu Asn   Lys Leu Pro Glu   Pro Glu Glu Leu Asp Leu   Glu
        1285                  1290                  1295

cca gag aac atg   gag agc gtc ccc   ctg gac ccc tcg gcc tcc   tcg      3978
Pro Glu Asn Met   Glu Ser Val Pro   Leu Asp Pro Ser Ala Ser   Ser
        1300                  1305                  1310

tcc tcc ctg cca   ctg ccc gac aga   cac tca gga cac aag gcc   gag      4023
Ser Ser Leu Pro   Leu Pro Asp Arg   His Ser Gly His Lys Ala   Glu
        1315                  1320                  1325

aac ggc ccc ggc   cct ggg gtg ctg   gtc ctc cgc gcc agc ttc   gac      4068
Asn Gly Pro Gly   Pro Gly Val Leu   Val Leu Arg Ala Ser Phe   Asp
        1330                  1335                  1340
```

274

```
gag aga cag cct  tac gcc cac atg aac  ggg ggc cgc aag aac  gag       4113
Glu Arg Gln Pro  Tyr Ala His Met Asn  Gly Gly Arg Lys Asn  Glu
            1345              1350                   1355

cgg gcc ttg ccg  ctg ccc cag tct tcg  acc tgc tga tccttggatc        4159
Arg Ala Leu Pro  Leu Pro Gln Ser Ser  Thr Cys
            1360              1365
```

```
ctgaatctgt gcaaacagta acgtgtgcgc acgcgcagcg gggtggggggg ggagagagag   4219

ttttaacaat ccattcacaa gcctcctgta cctcagtgga tcttcagttc tgcccttgct    4279

gcccgcggga gacagcttct ctgcagtaaa acacatttgg gatgttcctt ttttcaatat    4339

gcaagcagct ttttattccc tgcccaaacc cttaactgac atgggccttt aagaacctta    4399

atgacaacac ttaatagcaa cagagcactt gagaaccagt ctcctcactc tgtccctgtc    4459

cttccctgtt ctccctttct ctctcctctc tgcttcataa cggaaaaata attgccacaa    4519

gtccagctgg gaagcccttt ttatcagttt gaggaagtgg ctgtccctgt ggccccatcc    4579

aaccactgta cacacccgcc tgacaccgtg ggtcattaca aaaaaacacg tggagatgga    4639

aattttacc tttatctttc acctttctag ggacatgaaa tttacaaagg gccatcgttc     4699

atccaaggct gttaccattt taacgctgcc taattttgcc aaaatcctga actttctccc    4759

tcatcggccc ggcgctgatt cctcgtgtcc ggaggcatgg gtgagcatgg cagctggttg    4819

ctccatttga gagacacgct ggcgacacac tccgtccatc cgactgcccc tgctgtgctg    4879

ctcaaggcca caggcacaca ggtctcattg cttctgacta gattattatt tgggggaact    4939

ggacacaata ggtctttctc tcagtgaagg tggggagaag ctgaaccggc               4989
```

```
<210>  120
<211>  1367
<212>  PRT
<213>  Homo sapiens

<400>  120
```

```
Met Lys Ser Gly Ser Gly Gly Gly Ser Pro Thr Ser Leu Trp Gly Leu
1               5                   10                  15


Leu Phe Leu Ser Ala Ala Leu Ser Leu Trp Pro Thr Ser Gly Glu Ile
            20                  25                  30


Cys Gly Pro Gly Ile Asp Ile Arg Asn Asp Tyr Gln Gln Leu Lys Arg
        35                  40                  45
```

275

```
Leu Glu Asn Cys Thr Val Ile Glu Gly Tyr Leu His Ile Leu Leu Ile
    50                  55                  60

Ser Lys Ala Glu Asp Tyr Arg Ser Tyr Arg Phe Pro Lys Leu Thr Val
65                  70                  75                  80

Ile Thr Glu Tyr Leu Leu Leu Phe Arg Val Ala Gly Leu Glu Ser Leu
                85                  90                  95

Gly Asp Leu Phe Pro Asn Leu Thr Val Ile Arg Gly Trp Lys Leu Phe
                100                 105                 110

Tyr Asn Tyr Ala Leu Val Ile Phe Glu Met Thr Asn Leu Lys Asp Ile
            115                 120                 125

Gly Leu Tyr Asn Leu Arg Asn Ile Thr Arg Gly Ala Ile Arg Ile Glu
    130                 135                 140

Lys Asn Ala Asp Leu Cys Tyr Leu Ser Thr Val Asp Trp Ser Leu Ile
145                 150                 155                 160

Leu Asp Ala Val Ser Asn Asn Tyr Ile Val Gly Asn Lys Pro Pro Lys
                165                 170                 175

Glu Cys Gly Asp Leu Cys Pro Gly Thr Met Glu Glu Lys Pro Met Cys
            180                 185                 190

Glu Lys Thr Thr Ile Asn Asn Glu Tyr Asn Tyr Arg Cys Trp Thr Thr
    195                 200                 205

Asn Arg Cys Gln Lys Met Cys Pro Ser Thr Cys Gly Lys Arg Ala Cys
    210                 215                 220

Thr Glu Asn Asn Glu Cys Cys His Pro Glu Cys Leu Gly Ser Cys Ser
225                 230                 235                 240

Ala Pro Asp Asn Asp Thr Ala Cys Val Ala Cys Arg His Tyr Tyr Tyr
                245                 250                 255

Ala Gly Val Cys Val Pro Ala Cys Pro Pro Asn Thr Tyr Arg Phe Glu
                260                 265                 270
```

276

```
Gly Trp Arg Cys Val Asp Arg Asp Phe Cys Ala Asn Ile Leu Ser Ala
        275             280             285

Glu Ser Ser Asp Ser Glu Gly Phe Val Ile His Asp Gly Glu Cys Met
    290             295             300

Gln Glu Cys Pro Ser Gly Phe Ile Arg Asn Gly Ser Gln Ser Met Tyr
305             310             315             320

Cys Ile Pro Cys Glu Gly Pro Cys Pro Lys Val Cys Glu Glu Glu Lys
            325             330             335

Lys Thr Lys Thr Ile Asp Ser Val Thr Ser Ala Gln Met Leu Gln Gly
        340             345             350

Cys Thr Ile Phe Lys Gly Asn Leu Leu Ile Asn Ile Arg Arg Gly Asn
    355             360             365

Asn Ile Ala Ser Glu Leu Glu Asn Phe Met Gly Leu Ile Glu Val Val
    370             375             380

Thr Gly Tyr Val Lys Ile Arg His Ser His Ala Leu Val Ser Leu Ser
385             390             395             400

Phe Leu Lys Asn Leu Arg Leu Ile Leu Gly Glu Glu Gln Leu Glu Gly
            405             410             415

Asn Tyr Ser Phe Tyr Val Leu Asp Asn Gln Asn Leu Gln Gln Leu Trp
            420             425             430

Asp Trp Asp His Arg Asn Leu Thr Ile Lys Ala Gly Lys Met Tyr Phe
        435             440             445

Ala Phe Asn Pro Lys Leu Cys Val Ser Glu Ile Tyr Arg Met Glu Glu
    450             455             460

Val Thr Gly Thr Lys Gly Arg Gln Ser Lys Gly Asp Ile Asn Thr Arg
465             470             475             480

Asn Asn Gly Glu Arg Ala Ser Cys Glu Ser Asp Val Leu His Phe Thr
            485             490             495
```

277

```
Ser Thr Thr Thr Ser Lys Asn Arg Ile Ile Ile Thr Trp His Arg Tyr
          500           505               510

Arg Pro Pro Asp Tyr Arg Asp Leu Ile Ser Phe Thr Val Tyr Tyr Lys
          515           520               525

Glu Ala Pro Phe Lys Asn Val Thr Glu Tyr Asp Gly Gln Asp Ala Cys
          530           535               540

Gly Ser Asn Ser Trp Asn Met Val Asp Val Asp Leu Pro Pro Asn Lys
545               550           555               560

Asp Val Glu Pro Gly Ile Leu Leu His Gly Leu Lys Pro Trp Thr Gln
              565           570               575

Tyr Ala Val Tyr Val Lys Ala Val Thr Leu Thr Met Val Glu Asn Asp
              580           585               590

His Ile Arg Gly Ala Lys Ser Glu Ile Leu Tyr Ile Arg Thr Asn Ala
          595           600               605

Ser Val Pro Ser Ile Pro Leu Asp Val Leu Ser Ala Ser Asn Ser Ser
    610           615               620

Ser Gln Leu Ile Val Lys Trp Asn Pro Pro Ser Leu Pro Asn Gly Asn
625               630           635               640

Leu Ser Tyr Tyr Ile Val Arg Trp Gln Arg Gln Pro Gln Asp Gly Tyr
              645           650               655

Leu Tyr Arg His Asn Tyr Cys Ser Lys Asp Lys Ile Pro Ile Arg Lys
          660           665               670

Tyr Ala Asp Gly Thr Ile Asp Ile Glu Glu Val Thr Glu Asn Pro Lys
          675           680               685

Thr Glu Val Cys Gly Gly Glu Lys Gly Pro Cys Cys Ala Cys Pro Lys
          690           695               700

Thr Glu Ala Glu Lys Gln Ala Glu Lys Glu Glu Ala Glu Tyr Arg Lys
705               710               715               720
```

278

Val Phe Glu Asn Phe Leu His Asn Ser Ile Phe Val Pro Arg Pro Glu
                725   730   735

Arg Lys Arg Arg Asp Val Met Gln Val Ala Asn Thr Thr Met Ser Ser
        740   745   750

Arg Ser Arg Asn Thr Thr Ala Ala Asp Thr Tyr Asn Ile Thr Asp Pro
        755   760   765

Glu Glu Leu Glu Thr Glu Tyr Pro Phe Phe Glu Ser Arg Val Asp Asn
    770   775   780

Lys Glu Arg Thr Val Ile Ser Asn Leu Arg Pro Phe Thr Leu Tyr Arg
785   790   795   800

Ile Asp Ile His Ser Cys Asn His Glu Ala Glu Lys Leu Gly Cys Ser
            805   810   815

Ala Ser Asn Phe Val Phe Ala Arg Thr Met Pro Ala Glu Gly Ala Asp
        820   825   830

Asp Ile Pro Gly Pro Val Thr Trp Glu Pro Arg Pro Glu Asn Ser Ile
        835   840   845

Phe Leu Lys Trp Pro Glu Pro Glu Asn Pro Asn Gly Leu Ile Leu Met
    850   855   860

Tyr Glu Ile Lys Tyr Gly Ser Gln Val Glu Asp Gln Arg Glu Cys Val
865   870   875   880

Ser Arg Gln Glu Tyr Arg Lys Tyr Gly Gly Ala Lys Leu Asn Arg Leu
            885   890   895

Asn Pro Gly Asn Tyr Thr Ala Arg Ile Gln Ala Thr Ser Leu Ser Gly
            900   905   910

Asn Gly Ser Trp Thr Asp Pro Val Phe Phe Tyr Val Gln Ala Lys Thr
        915   920   925

Gly Tyr Glu Asn Phe Ile His Leu Ile Ile Ala Leu Pro Val Ala Val
    930   935   940

279

Leu Leu Ile Val Gly Gly Leu Val Ile Met Leu Tyr Val Phe His Arg
945   950   955   960

Lys Arg Asn Asn Ser Arg Leu Gly Asn Gly Val Leu Tyr Ala Ser Val
                965   970   975

Asn Pro Glu Tyr Phe Ser Ala Ala Asp Val Tyr Val Pro Asp Glu Trp
            980   985   990

Glu Val Ala Arg Glu Lys Ile Thr Met Ser Arg Glu Leu Gly Gln Gly
        995   1000   1005

Ser Phe Gly Met Val Tyr Glu Gly Val Ala Lys Gly Val Val Lys
    1010   1015   1020

Asp Glu Pro Glu Thr Arg Val Ala Ile Lys Thr Val Asn Glu Ala
    1025   1030   1035

Ala Ser Met Arg Glu Arg Ile Glu Phe Leu Asn Glu Ala Ser Val
    1040   1045   1050

Met Lys Glu Phe Asn Cys His His Val Val Arg Leu Leu Gly Val
    1055   1060   1065

Val Ser Gln Gly Gln Pro Thr Leu Val Ile Met Glu Leu Met Thr
    1070   1075   1080

Arg Gly Asp Leu Lys Ser Tyr Leu Arg Ser Leu Arg Pro Glu Met
    1085   1090   1095

Glu Asn Asn Pro Val Leu Ala Pro Pro Ser Leu Ser Lys Met Ile
    1100   1105   1110

Gln Met Ala Gly Glu Ile Ala Asp Gly Met Ala Tyr Leu Asn Ala
    1115   1120   1125

Asn Lys Phe Val His Arg Asp Leu Ala Ala Arg Asn Cys Met Val
    1130   1135   1140

Ala Glu Asp Phe Thr Val Lys Ile Gly Asp Phe Gly Met Thr Arg
    1145   1150   1155

280

Asp Ile Tyr Glu Thr Asp Tyr Tyr Arg Lys Gly Gly Lys Gly Leu
    1160   1165   1170

Leu Pro Val Arg Trp Met Ser Pro Glu Ser Leu Lys Asp Gly Val
    1175   1180   1185

Phe Thr Thr Tyr Ser Asp Val Trp Ser Phe Gly Val Val Leu Trp
    1190   1195   1200

Glu Ile Ala Thr Leu Ala Glu Gln Pro Tyr Gln Gly Leu Ser Asn
    1205   1210   1215

Glu Gln Val Leu Arg Phe Val Met Glu Gly Gly Leu Leu Asp Lys
    1220   1225   1230

Pro Asp Asn Cys Pro Asp Met Leu Phe Glu Leu Met Arg Met Cys
    1235   1240   1245

Trp Gln Tyr Asn Pro Lys Met Arg Pro Ser Phe Leu Glu Ile Ile
    1250   1255   1260

Ser Ser Ile Lys Glu Glu Met Glu Pro Gly Phe Arg Glu Val Ser
    1265   1270   1275

Phe Tyr Tyr Ser Glu Glu Asn Lys Leu Pro Glu Pro Glu Glu Leu
    1280   1285   1290

Asp Leu Glu Pro Glu Asn Met Glu Ser Val Pro Leu Asp Pro Ser
    1295   1300   1305

Ala Ser Ser Ser Ser Leu Pro Leu Pro Asp Arg His Ser Gly His
    1310   1315   1320

Lys Ala Glu Asn Gly Pro Gly Pro Gly Val Leu Val Leu Arg Ala
    1325   1330   1335

Ser Phe Asp Glu Arg Gln Pro Tyr Ala His Met Asn Gly Gly Arg
    1340   1345   1350

Lys Asn Glu Arg Ala Leu Pro Leu Pro Gln Ser Ser Thr Cys
    1355   1360   1365

281

<210> 121
<211> 640
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (17)..(592)
<223>

<400> 121
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tcgggcctcc gaaacc atg aac ttt ctg ctg tct tgg gtg cat tgg agc ctt      52
                   Met Asn Phe Leu Leu Ser Trp Val His Trp Ser Leu
                   1               5                   10

gcc ttg ctg ctc tac ctc cac cat gcc aag tgg tcc cag gct gca ccc      100
Ala Leu Leu Leu Tyr Leu His His Ala Lys Trp Ser Gln Ala Ala Pro
            15                  20                  25

atg gca gaa gga ggg ggg cag aat cat cac gaa gtg gtg aag ttc atg      148
Met Ala Glu Gly Gly Gly Gln Asn His His Glu Val Val Lys Phe Met
        30                  35                  40

gat gtc tat cag cgc agc tac tgc cat cca atc gag acc ctg gtg gac      196
Asp Val Tyr Gln Arg Ser Tyr Cys His Pro Ile Glu Thr Leu Val Asp
45                  50                  55                  60

atc ttc cag gag tac cct gat gag atc gag tac atc ttc aag cca tcc      244
Ile Phe Gln Glu Tyr Pro Asp Glu Ile Glu Tyr Ile Phe Lys Pro Ser
                65                  70                  75

tgt gtg ccc ctg atg cga tgc ggg ggc tgc tgc aat gac gag ggc ctg      292
Cys Val Pro Leu Met Arg Cys Gly Gly Cys Cys Asn Asp Glu Gly Leu
            80                  85                  90

gag tgt gtg ccc act gag gag tcc aac atc acc atg cag att atg cgg      340
Glu Cys Val Pro Thr Glu Glu Ser Asn Ile Thr Met Gln Ile Met Arg
        95                  100                 105

atc aaa cct cac caa ggc cag cac ata gga gag atg agc ttc cta cag      388
Ile Lys Pro His Gln Gly Gln His Ile Gly Glu Met Ser Phe Leu Gln
        110                 115                 120

cac aac aaa tgt gaa tgc aga cca aag aaa gat aga gca aga caa gaa      436
His Asn Lys Cys Glu Cys Arg Pro Lys Lys Asp Arg Ala Arg Gln Glu
125                 130                 135                 140

aat ccc tgt ggg cct tgc tca gag cgg aga aag cat ttg ttt gta caa      484
Asn Pro Cys Gly Pro Cys Ser Glu Arg Arg Lys His Leu Phe Val Gln
                145                 150                 155

gat ccg cag acg tgt aaa tgt tcc tgc aaa aac aca gac tcg cgt tgc      532
Asp Pro Gln Thr Cys Lys Cys Ser Cys Lys Asn Thr Asp Ser Arg Cys
                160                 165                 170
```

282

```
aag gcg agg cag ctt gag tta aac gaa cgt act tgc aga tgt gac aag        580
Lys Ala Arg Gln Leu Glu Leu Asn Glu Arg Thr Cys Arg Cys Asp Lys
        175                 180             185

ccg agg cgg tga gccgggcagg aggaaggagc ctccctcagg gtttcgggaa            632
Pro Arg Arg
        190

ccagatct                                                               640
```

<210> 122
<211> 191
<212> PRT
<213> Homo sapiens

<400> 122

```
Met Asn Phe Leu Leu Ser Trp Val His Trp Ser Leu Ala Leu Leu Leu
1               5                   10                  15

Tyr Leu His His Ala Lys Trp Ser Gln Ala Ala Pro Met Ala Glu Gly
            20                  25                  30

Gly Gly Gln Asn His His Glu Val Val Lys Phe Met Asp Val Tyr Gln
        35                  40                  45

Arg Ser Tyr Cys His Pro Ile Glu Thr Leu Val Asp Ile Phe Gln Glu
    50                  55                  60

Tyr Pro Asp Glu Ile Glu Tyr Ile Phe Lys Pro Ser Cys Val Pro Leu
65                  70                  75                  80

Met Arg Cys Gly Gly Cys Cys Asn Asp Glu Gly Leu Glu Cys Val Pro
                85                  90                  95

Thr Glu Glu Ser Asn Ile Thr Met Gln Ile Met Arg Ile Lys Pro His
            100                 105                 110

Gln Gly Gln His Ile Gly Glu Met Ser Phe Leu Gln His Asn Lys Cys
        115                 120                 125

Glu Cys Arg Pro Lys Lys Asp Arg Ala Arg Gln Glu Asn Pro Cys Gly
    130                 135                 140
```

283

```
Pro Cys Ser Glu Arg Arg Lys His Leu Phe Val Gln Asp Pro Gln Thr
145             150             155             160
```

```
Cys Lys Cys Ser Cys Lys Asn Thr Asp Ser Arg Cys Lys Ala Arg Gln
                165             170             175
```

```
Leu Glu Leu Asn Glu Arg Thr Cys Arg Cys Asp Lys Pro Arg Arg
            180             185             190
```

<210> 123
<211> 3690
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (256)..(3690)
<223>

<400> 123

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ctggaggggt ataaatacct gatggctgct gccagggtca caactttaca gggagttgaa      60

gactgagact ctggccccac gggacacagt gtcactggtt tgaaacttct cagccacctt     120

ggtgaaggga ctgagctgtt agagacactt ctgaggctcc tcacgcttgg gtcttgttca     180

ctccacggag tagcctagtc aactgcaaga gaacggagaa cgttggattt ggagcagaag     240

tgcaaagtct cagac atg gct tgc ccc tgg aag ttt ctc ttc aaa gtc aaa     291
                  Met Ala Cys Pro Trp Lys Phe Leu Phe Lys Val Lys
                  1               5                   10

tcc tac caa agt gac ctg aaa gag gaa aag gac att aac aac aac gtg     339
Ser Tyr Gln Ser Asp Leu Lys Glu Glu Lys Asp Ile Asn Asn Asn Val
        15              20                  25

aag aaa acc cct tgt gct gtt ctc agc cca aca ata caa gat gac cct     387
Lys Lys Thr Pro Cys Ala Val Leu Ser Pro Thr Ile Gln Asp Asp Pro
    30              35                  40

aag agt cac caa aat ggc tcc ccg cag ctc ctc act ggg aca gca cag     435
Lys Ser His Gln Asn Gly Ser Pro Gln Leu Leu Thr Gly Thr Ala Gln
45              50                  55                  60

aat gtt cca gaa tcc ctg gac aag ctg cat gtg aca tcg acc cgt cca     483
Asn Val Pro Glu Ser Leu Asp Lys Leu His Val Thr Ser Thr Arg Pro
                65                  70                  75

cag tat gtg agg atc aaa aac tgg ggc agt gga gag att ttg cat gac     531
Gln Tyr Val Arg Ile Lys Asn Trp Gly Ser Gly Glu Ile Leu His Asp
            80                  85                  90
```

284

```
act ctt cac cac aag gcc aca tcg gat ttc act tgc aag tcc aag tct      579
Thr Leu His His Lys Ala Thr Ser Asp Phe Thr Cys Lys Ser Lys Ser
        95              100                 105

tgc ttg ggg tcc atc atg aac ccc aag agt ttg acc aga gga ccc aga      627
Cys Leu Gly Ser Ile Met Asn Pro Lys Ser Leu Thr Arg Gly Pro Arg
        110             115                 120

gac aag cct acc cct ctg gag gag ctc ctg cct cat gcc att gag ttc      675
Asp Lys Pro Thr Pro Leu Glu Glu Leu Leu Pro His Ala Ile Glu Phe
125             130             135                     140

atc aac cag tat tat ggc tcc ttt aaa gag gca aaa ata gag gaa cat      723
Ile Asn Gln Tyr Tyr Gly Ser Phe Lys Glu Ala Lys Ile Glu Glu His
                145             150                 155

ctg gcc agg ctg gaa gct gta aca aag gaa ata gaa aca aca gga acc      771
Leu Ala Arg Leu Glu Ala Val Thr Lys Glu Ile Glu Thr Thr Gly Thr
        160                 165                 170

tac cag ctc act ctg gat gag ctc atc ttt gcc acc aag atg gcc tgg      819
Tyr Gln Leu Thr Leu Asp Glu Leu Ile Phe Ala Thr Lys Met Ala Trp
        175                 180                 185

agg aat gcc cct cgc tgc atc ggc agg atc cag tgg tcc aac ctg cag      867
Arg Asn Ala Pro Arg Cys Ile Gly Arg Ile Gln Trp Ser Asn Leu Gln
        190             195                 200

gtc ttt gac gct cgg aac tgt agc aca gca cag gaa atg ttt cag cac      915
Val Phe Asp Ala Arg Asn Cys Ser Thr Ala Gln Glu Met Phe Gln His
205             210             215                     220

atc tgc aga cac ata ctt tat gcc acc aac aat ggc aac atc agg tcg      963
Ile Cys Arg His Ile Leu Tyr Ala Thr Asn Asn Gly Asn Ile Arg Ser
                225             230                 235

gcc atc act gtg ttc ccc cag cgg agt gac ggc aaa cat gac ttc agg     1011
Ala Ile Thr Val Phe Pro Gln Arg Ser Asp Gly Lys His Asp Phe Arg
        240                 245                 250

ctc tgg aat tca cag ctc atc cgg tac gct ggc tac cag atg ccc gat     1059
Leu Trp Asn Ser Gln Leu Ile Arg Tyr Ala Gly Tyr Gln Met Pro Asp
        255                 260                 265

ggc acc atc aga ggg gat gct gcc acc ttg gag ttc acc cag ttg tgc     1107
Gly Thr Ile Arg Gly Asp Ala Ala Thr Leu Glu Phe Thr Gln Leu Cys
        270                 275                 280

atc gac cta ggc tgg aag ccc cgc tat ggc cgc ttt gat gtg ctg cct     1155
Ile Asp Leu Gly Trp Lys Pro Arg Tyr Gly Arg Phe Asp Val Leu Pro
285             290                 295                 300

ctg gtc ttg caa gct gat ggt caa gat cca gag gtc ttt gaa atc cct     1203
Leu Val Leu Gln Ala Asp Gly Gln Asp Pro Glu Val Phe Glu Ile Pro
                305             310                 315
```

285

```
cct gat ctt gtg ttg gag gtg acc atg gag cat ccc aag tac gag tgg    1251
Pro Asp Leu Val Leu Glu Val Thr Met Glu His Pro Lys Tyr Glu Trp
            320                 325                 330

ttc cag gag ctc ggg ttg aag tgg tat gca ctg cct gcc gtg gcc aac    1299
Phe Gln Glu Leu Gly Leu Lys Trp Tyr Ala Leu Pro Ala Val Ala Asn
            335                 340                 345

atg cta ctg gag gtg ggt ggc ctc gaa ttc cca gcc tgc ccc ttc aat    1347
Met Leu Leu Glu Val Gly Gly Leu Glu Phe Pro Ala Cys Pro Phe Asn
            350             355                 360

ggt tgg tac atg ggc acc gag att gga gtt cga gac ttc tgt gac aca    1395
Gly Trp Tyr Met Gly Thr Glu Ile Gly Val Arg Asp Phe Cys Asp Thr
365             370                 375                 380

cag cgc tac aac atc ctg gag gaa gtg ggc cga agg atg ggc ctg gag    1443
Gln Arg Tyr Asn Ile Leu Glu Glu Val Gly Arg Arg Met Gly Leu Glu
            385                 390                 395

acc cac aca ctg gcc tcc ctc tgg aaa gac cgg gct gtc acg gag atc    1491
Thr His Thr Leu Ala Ser Leu Trp Lys Asp Arg Ala Val Thr Glu Ile
            400                 405                 410

aat gtg gct gtg ctc cat agt ttc cag aag cag aat gtg acc atc atg    1539
Asn Val Ala Val Leu His Ser Phe Gln Lys Gln Asn Val Thr Ile Met
            415                 420                 425

gac cac cac aca gcc tca gag tcc ttc atg aag cac atg cag aat gag    1587
Asp His His Thr Ala Ser Glu Ser Phe Met Lys His Met Gln Asn Glu
            430             435                 440

tac cgg gcc cgt gga ggc tgc ccg gca gac tgg att tgg ctg gtc cct    1635
Tyr Arg Ala Arg Gly Gly Cys Pro Ala Asp Trp Ile Trp Leu Val Pro
445             450                 455                 460

cca gtg tct ggg agc atc acc cct gtg ttc cac cag gag atg ttg aac    1683
Pro Val Ser Gly Ser Ile Thr Pro Val Phe His Gln Glu Met Leu Asn
                465                 470                 475

tat gtc cta tct cca ttc tac tac tac cag atc gag ccc tgg aag acc    1731
Tyr Val Leu Ser Pro Phe Tyr Tyr Tyr Gln Ile Glu Pro Trp Lys Thr
            480                 485                 490

cac atc tgg cag aat gag aag ctg agg ccc agg agg aga gag atc cga    1779
His Ile Trp Gln Asn Glu Lys Leu Arg Pro Arg Arg Arg Glu Ile Arg
            495                 500                 505

ttt aga gtc ttg gtg aaa gtg gtg ttc ttt gct tcc atg cta atg cga    1827
Phe Arg Val Leu Val Lys Val Val Phe Phe Ala Ser Met Leu Met Arg
            510                 515                 520

aag gtc atg gct tca cgg gtc aga gcc aca gtc ctc ttt gct act gag    1875
Lys Val Met Ala Ser Arg Val Arg Ala Thr Val Leu Phe Ala Thr Glu
525             530                 535                 540
```

286

```
aca ggg aag tct gaa gca cta gcc agg gac ctg gcc acc ttg ttc agc      1923
Thr Gly Lys Ser Glu Ala Leu Ala Arg Asp Leu Ala Thr Leu Phe Ser
            545                 550                 555

tac gcc ttc aac acc aag gtt gtc tgc atg gac cag tat aag gca agc      1971
Tyr Ala Phe Asn Thr Lys Val Val Cys Met Asp Gln Tyr Lys Ala Ser
            560                 565                 570

acc ttg gaa gag gag caa cta ctg ctg gtg gtg aca agc aca ttt ggg      2019
Thr Leu Glu Glu Glu Gln Leu Leu Leu Val Val Thr Ser Thr Phe Gly
            575                 580                 585

aat gga gac tgt ccc agc aat ggg cag act ctg aag aaa tct ctg ttc      2067
Asn Gly Asp Cys Pro Ser Asn Gly Gln Thr Leu Lys Lys Ser Leu Phe
            590                 595                 600

atg ctt aga gaa ctc aac cac acc ttc agg tat gct gtg ttt ggc ctt      2115
Met Leu Arg Glu Leu Asn His Thr Phe Arg Tyr Ala Val Phe Gly Leu
605                 610                 615                 620

ggc tcc agc atg tac cct cag ttc tgc gcc ttt gct cat gac atc gac      2163
Gly Ser Ser Met Tyr Pro Gln Phe Cys Ala Phe Ala His Asp Ile Asp
            625                 630                 635

cag aag ctg tcc cac ctg gga gcc tct cag ctt gcc cca aca gga gaa      2211
Gln Lys Leu Ser His Leu Gly Ala Ser Gln Leu Ala Pro Thr Gly Glu
            640                 645                 650

ggg gac gaa ctc agt ggg cag gag gat gcc ttc cgc agc tgg gct gta      2259
Gly Asp Glu Leu Ser Gly Gln Glu Asp Ala Phe Arg Ser Trp Ala Val
            655                 660                 665

caa acc ttc cgg gca gcc tgt gag acc ttt gat gtc cga agc aaa cat      2307
Gln Thr Phe Arg Ala Ala Cys Glu Thr Phe Asp Val Arg Ser Lys His
            670                 675                 680

cac att cag atc ccg aaa cgc ttc act tcc aat gca aca tgg gag cca      2355
His Ile Gln Ile Pro Lys Arg Phe Thr Ser Asn Ala Thr Trp Glu Pro
685                 690                 695                 700

cag caa tat agg ctc atc cag agc ccg gag cct tta gac ctc aac aga      2403
Gln Gln Tyr Arg Leu Ile Gln Ser Pro Glu Pro Leu Asp Leu Asn Arg
            705                 710                 715

gcc ctc agc agc atc cat gca aag aac gtg ttt acc atg agg ctg aaa      2451
Ala Leu Ser Ser Ile His Ala Lys Asn Val Phe Thr Met Arg Leu Lys
            720                 725                 730

tcc cag cag aat ctg cag agt gaa aag tcc agc cgc acc acc ctc ctc      2499
Ser Gln Gln Asn Leu Gln Ser Glu Lys Ser Ser Arg Thr Thr Leu Leu
            735                 740                 745

gtt cag ctc acc ttc gag ggc agc cga ggg ccc agc tac ctg cct ggg      2547
Val Gln Leu Thr Phe Glu Gly Ser Arg Gly Pro Ser Tyr Leu Pro Gly
            750                 755                 760
```

287

```
gaa cac ctg ggg atc ttc cca ggc aac cag acc gcc ctg gtg cag gga      2595
Glu His Leu Gly Ile Phe Pro Gly Asn Gln Thr Ala Leu Val Gln Gly
765             770             775             780

atc ttg gag cga gtt gtg gat tgt cct aca cca cac caa act gtg tgc      2643
Ile Leu Glu Arg Val Val Asp Cys Pro Thr Pro His Gln Thr Val Cys
                785             790             795

ctg gag gtt ctg gat gag agc ggc agc tac tgg gtc aaa gac aag agg      2691
Leu Glu Val Leu Asp Glu Ser Gly Ser Tyr Trp Val Lys Asp Lys Arg
                800             805             810

ctg ccc ccc tgc tca ctc agc caa gcc ctc acc tac ttc ctg gac att      2739
Leu Pro Pro Cys Ser Leu Ser Gln Ala Leu Thr Tyr Phe Leu Asp Ile
        815             820             825

acg acc cct ccc acc cag ctg cag ctc cac aag ctg gct cgc ttt gcc      2787
Thr Thr Pro Pro Thr Gln Leu Gln Leu His Lys Leu Ala Arg Phe Ala
        830             835             840

acg gac gag acg gat agg cag aga ttg gag gcc ttg tgt cag ccc tca      2835
Thr Asp Glu Thr Asp Arg Gln Arg Leu Glu Ala Leu Cys Gln Pro Ser
845             850             855             860

gag tac aat gac tgg aag ttc agc aac aac ccc acg ttc ctg gag gtg      2883
Glu Tyr Asn Asp Trp Lys Phe Ser Asn Asn Pro Thr Phe Leu Glu Val
                865             870             875

ctt gaa gag ttc cct tcc ttg cat gtg ccc gct gcc ttc ctg ctg tcg      2931
Leu Glu Glu Phe Pro Ser Leu His Val Pro Ala Ala Phe Leu Leu Ser
        880             885             890

cag ctc cct atc ttg aag ccc cgc tac tac tcc atc agc tcc tcc cag      2979
Gln Leu Pro Ile Leu Lys Pro Arg Tyr Tyr Ser Ile Ser Ser Ser Gln
        895             900             905

gac cac acc ccc tcg gag gtt cac ctc act gtg gcc gtg gtc acc tac      3027
Asp His Thr Pro Ser Glu Val His Leu Thr Val Ala Val Val Thr Tyr
    910             915             920

cgc acc cga gat ggt cag ggt ccc ctg cac cat ggt gtc tgc agc act      3075
Arg Thr Arg Asp Gly Gln Gly Pro Leu His His Gly Val Cys Ser Thr
925             930             935             940

tgg atc agg aac ctg aag ccc cag gac cca gtg ccc tgc ttt gtg cga      3123
Trp Ile Arg Asn Leu Lys Pro Gln Asp Pro Val Pro Cys Phe Val Arg
                945             950             955

agt gtc agt ggc ttc cag ctc cct gag gac ccc tcc cag cct tgc atc      3171
Ser Val Ser Gly Phe Gln Leu Pro Glu Asp Pro Ser Gln Pro Cys Ile
                960             965             970

ctc att ggg cct ggt acg ggc att gct ccc ttc cga agt ttc tgg cag      3219
Leu Ile Gly Pro Gly Thr Gly Ile Ala Pro Phe Arg Ser Phe Trp Gln
        975             980             985
```

288

```
cag cgg ctc cat gac tcc cag cac aaa ggg ctc aaa   gga ggc cgc atg   3267
Gln Arg Leu His Asp Ser Gln His Lys Gly Leu Lys   Gly Gly Arg Met
    990                 995               1000

agc ttg gtg ttt ggg tgc  cgg cac ccg gag gag   gac cac ctc tat   3312
Ser Leu Val Phe Gly Cys  Arg His Pro Glu Glu   Asp His Leu Tyr
1005             1010              1015

cag gaa gaa atg cag gag  atg gtc cgc aag aga   gtg ctg ttc cag   3357
Gln Glu Glu Met Gln Glu  Met Val Arg Lys Arg   Val Leu Phe Gln
1020             1025              1030

gtg cac aca ggc tac tcc  cgg ctg ccc ggc aaa   ccc aag gtc tac   3402
Val His Thr Gly Tyr Ser  Arg Leu Pro Gly Lys   Pro Lys Val Tyr
1035             1040              1045

gtt cag gac atc ctg caa  aag cag ctg gcc aat   gag gta ctc agc   3447
Val Gln Asp Ile Leu Gln  Lys Gln Leu Ala Asn   Glu Val Leu Ser
1050             1055              1060

gtg ctc cac ggg gag cag  ggc cac ctc tac att  tgc gga gat gtg   3492
Val Leu His Gly Glu Gln  Gly His Leu Tyr Ile  Cys Gly Asp Val
1065                 1070              1075

cgc atg gct cgg gat gtg  gct acc aca ttg aag   aag ctg gtg gcc   3537
Arg Met Ala Arg Asp Val  Ala Thr Thr Leu Lys   Lys Leu Val Ala
1080             1085              1090

acc aag ctg aac ttg agc  gag gag cag gtg gaa   gac tat ttc ttc   3582
Thr Lys Leu Asn Leu Ser  Glu Glu Gln Val Glu   Asp Tyr Phe Phe
1095             1100              1105

cag ctc aag agc cag aaa  cgt tat cat gaa gat   atc ttc ggt gca   3627
Gln Leu Lys Ser Gln Lys  Arg Tyr His Glu Asp   Ile Phe Gly Ala
1110             1115              1120

gtc ttt tcc tat ggg gca  aaa aag ggc agc gcc   ttg gag gag ccc   3672
Val Phe Ser Tyr Gly Ala  Lys Lys Gly Ser Ala   Leu Glu Glu Pro
1125             1130              1135

aaa gcc acg agg ctc tga                                         3690
Lys Ala Thr Arg Leu
1140
```

<210> 124
<211> 1144
<212> PRT
<213> Mus musculus

<400> 124

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Met Ala Cys Pro Trp Lys Phe Leu Phe Lys Val Lys Ser Tyr Gln Ser
1               5                   10                  15
```

```
Asp Leu Lys Glu Glu Lys Asp Ile Asn Asn Asn Val Lys Lys Thr Pro
        20              25              30

Cys Ala Val Leu Ser Pro Thr Ile Gln Asp Asp Pro Lys Ser His Gln
        35              40              45

Asn Gly Ser Pro Gln Leu Leu Thr Gly Thr Ala Gln Asn Val Pro Glu
    50              55              60

Ser Leu Asp Lys Leu His Val Thr Ser Thr Arg Pro Gln Tyr Val Arg
65              70              75              80

Ile Lys Asn Trp Gly Ser Gly Glu Ile Leu His Asp Thr Leu His His
            85              90              95

Lys Ala Thr Ser Asp Phe Thr Cys Lys Ser Lys Ser Cys Leu Gly Ser
        100             105             110

Ile Met Asn Pro Lys Ser Leu Thr Arg Gly Pro Arg Asp Lys Pro Thr
        115             120             125

Pro Leu Glu Glu Leu Leu Pro His Ala Ile Glu Phe Ile Asn Gln Tyr
    130             135             140

Tyr Gly Ser Phe Lys Glu Ala Lys Ile Glu Glu His Leu Ala Arg Leu
145             150             155             160

Glu Ala Val Thr Lys Glu Ile Glu Thr Thr Gly Thr Tyr Gln Leu Thr
            165             170             175

Leu Asp Glu Leu Ile Phe Ala Thr Lys Met Ala Trp Arg Asn Ala Pro
            180             185             190

Arg Cys Ile Gly Arg Ile Gln Trp Ser Asn Leu Gln Val Phe Asp Ala
        195             200             205

Arg Asn Cys Ser Thr Ala Gln Glu Met Phe Gln His Ile Cys Arg His
    210             215             220

Ile Leu Tyr Ala Thr Asn Asn Gly Asn Ile Arg Ser Ala Ile Thr Val
225             230             235             240
```

290

Phe Pro Gln Arg Ser Asp Gly Lys His Asp Phe Arg Leu Trp Asn Ser
        245   250   255

Gln Leu Ile Arg Tyr Ala Gly Tyr Gln Met Pro Asp Gly Thr Ile Arg
        260   265   270

Gly Asp Ala Ala Thr Leu Glu Phe Thr Gln Leu Cys Ile Asp Leu Gly
        275   280   285

Trp Lys Pro Arg Tyr Gly Arg Phe Asp Val Leu Pro Leu Val Leu Gln
    290   295   300

Ala Asp Gly Gln Asp Pro Glu Val Phe Glu Ile Pro Pro Asp Leu Val
305   310   315   320

Leu Glu Val Thr Met Glu His Pro Lys Tyr Glu Trp Phe Gln Glu Leu
            325   330   335

Gly Leu Lys Trp Tyr Ala Leu Pro Ala Val Ala Asn Met Leu Leu Glu
        340   345   350

Val Gly Gly Leu Glu Phe Pro Ala Cys Pro Phe Asn Gly Trp Tyr Met
        355   360   365

Gly Thr Glu Ile Gly Val Arg Asp Phe Cys Asp Thr Gln Arg Tyr Asn
    370   375   380

Ile Leu Glu Glu Val Gly Arg Arg Met Gly Leu Glu Thr His Thr Leu
385   390   395   400

Ala Ser Leu Trp Lys Asp Arg Ala Val Thr Glu Ile Asn Val Ala Val
            405   410   415

Leu His Ser Phe Gln Lys Gln Asn Val Thr Ile Met Asp His His Thr
        420   425   430

Ala Ser Glu Ser Phe Met Lys His Met Gln Asn Glu Tyr Arg Ala Arg
        435   440   445

Gly Gly Cys Pro Ala Asp Trp Ile Trp Leu Val Pro Pro Val Ser Gly
    450   455   460

291

Ser Ile Thr Pro Val Phe His Gln Glu Met Leu Asn Tyr Val Leu Ser
465   470   475   480

Pro Phe Tyr Tyr Tyr Gln Ile Glu Pro Trp Lys Thr His Ile Trp Gln
                485   490   495

Asn Glu Lys Leu Arg Pro Arg Arg Arg Glu Ile Arg Phe Arg Val Leu
              500   505   510

Val Lys Val Val Phe Phe Ala Ser Met Leu Met Arg Lys Val Met Ala
         515   520   525

Ser Arg Val Arg Ala Thr Val Leu Phe Ala Thr Glu Thr Gly Lys Ser
    530   535   540

Glu Ala Leu Ala Arg Asp Leu Ala Thr Leu Phe Ser Tyr Ala Phe Asn
545   550   555   560

Thr Lys Val Val Cys Met Asp Gln Tyr Lys Ala Ser Thr Leu Glu Glu
              565   570   575

Glu Gln Leu Leu Leu Val Val Thr Ser Thr Phe Gly Asn Gly Asp Cys
         580   585   590

Pro Ser Asn Gly Gln Thr Leu Lys Lys Ser Leu Phe Met Leu Arg Glu
         595   600   605

Leu Asn His Thr Phe Arg Tyr Ala Val Phe Gly Leu Gly Ser Ser Met
    610   615   620

Tyr Pro Gln Phe Cys Ala Phe Ala His Asp Ile Asp Gln Lys Leu Ser
625   630   635   640

His Leu Gly Ala Ser Gln Leu Ala Pro Thr Gly Glu Gly Asp Glu Leu
              645   650   655

Ser Gly Gln Glu Asp Ala Phe Arg Ser Trp Ala Val Gln Thr Phe Arg
         660   665   670

Ala Ala Cys Glu Thr Phe Asp Val Arg Ser Lys His His Ile Gln Ile
         675   680   685

292

```
Pro Lys Arg Phe Thr Ser Asn Ala Thr Trp Glu Pro Gln Gln Tyr Arg
    690                 695             700

Leu Ile Gln Ser Pro Glu Pro Leu Asp Leu Asn Arg Ala Leu Ser Ser
705                 710             715                 720

Ile His Ala Lys Asn Val Phe Thr Met Arg Leu Lys Ser Gln Gln Asn
            725                 730                 735

Leu Gln Ser Glu Lys Ser Ser Arg Thr Thr Leu Leu Val Gln Leu Thr
            740                 745             750

Phe Glu Gly Ser Arg Gly Pro Ser Tyr Leu Pro Gly Glu His Leu Gly
        755                 760             765

Ile Phe Pro Gly Asn Gln Thr Ala Leu Val Gln Gly Ile Leu Glu Arg
        770                 775             780

Val Val Asp Cys Pro Thr Pro His Gln Thr Val Cys Leu Glu Val Leu
785                 790                 795             800

Asp Glu Ser Gly Ser Tyr Trp Val Lys Asp Lys Arg Leu Pro Pro Cys
            805                 810                 815

Ser Leu Ser Gln Ala Leu Thr Tyr Phe Leu Asp Ile Thr Thr Pro Pro
            820                 825                 830

Thr Gln Leu Gln Leu His Lys Leu Ala Arg Phe Ala Thr Asp Glu Thr
        835                 840                 845

Asp Arg Gln Arg Leu Glu Ala Leu Cys Gln Pro Ser Glu Tyr Asn Asp
    850                 855                 860

Trp Lys Phe Ser Asn Asn Pro Thr Phe Leu Glu Val Leu Glu Glu Phe
865                 870                 875                 880

Pro Ser Leu His Val Pro Ala Ala Phe Leu Leu Ser Gln Leu Pro Ile
            885                 890                 895

Leu Lys Pro Arg Tyr Tyr Ser Ile Ser Ser Ser Gln Asp His Thr Pro
        900                 905                 910
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293

```
Ser Glu Val His Leu Thr Val Ala Val Val Thr Tyr Arg Thr Arg Asp
        915                 920              925

Gly Gln Gly Pro Leu His His Gly Val Cys Ser Thr Trp Ile Arg Asn
        930                 935              940

Leu Lys Pro Gln Asp Pro Val Pro Cys Phe Val Arg Ser Val Ser Gly
945                 950              955                  960

Phe Gln Leu Pro Glu Asp Pro Ser Gln Pro Cys Ile Leu Ile Gly Pro
                965              970                  975

Gly Thr Gly Ile Ala Pro Phe Arg Ser Phe Trp Gln Gln Arg Leu His
            980              985              990

Asp Ser Gln His Lys Gly Leu Lys Gly Gly Arg Met Ser  Leu Val Phe
        995                 1000             1005

Gly Cys  Arg His Pro Glu Glu  Asp His Leu Tyr Gln  Glu Glu Met
    1010                 1015             1020

Gln Glu  Met Val Arg Lys Arg  Val Leu Phe Gln Val  His Thr Gly
    1025                 1030             1035

Tyr Ser  Arg Leu Pro Gly Lys  Pro Lys Val Tyr Val  Gln Asp Ile
    1040                 1045             1050

Leu Gln  Lys Gln Leu Ala Asn  Glu Val Leu Ser Val  Leu His Gly
    1055                 1060             1065

Glu Gln  Gly His Leu Tyr Ile  Cys Gly Asp Val Arg  Met Ala Arg
    1070                 1075             1080

Asp Val  Ala Thr Thr Leu Lys  Lys Leu Val Ala Thr  Lys Leu Asn
    1085                 1090             1095

Leu Ser  Glu Glu Gln Val Glu  Asp Tyr Phe Phe Gln  Leu Lys Ser
    1100                 1105             1110

Gln Lys  Arg Tyr His Glu Asp  Ile Phe Gly Ala Val  Phe Ser Tyr
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294

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Leu

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caggattgct accatggtga tggacagagt tatcgaggca cgtactccac cactgtcaca   180

ggaaggacct gccaagcttg gtcatctatg acaccacatc aacataatag gaccacagaa   240

aactacccaa atgctggctt gatcatgaac tactgcagga tccagatgc tgtggcagct   300

ccttattgtt atacgaggga tcccggtgtc aggtgggagt actgcaacct gacgcaatgc   360

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295

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296

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297

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298

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Cys Tyr Thr Arg Asp Pro Gly Val Arg Trp Glu Tyr Cys Asn Leu Thr
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caa tgc tca gac gca gaa ggg act gcc gtc gcg cct ccg act gtt acc     6804
Gln Cys Ser Asp Ala Glu Gly Thr Ala Val Ala Pro Pro Thr Val Thr
                35                  40                  45

ccg gtt cca agc cta gag gct cct tcc gaa caa gca cca act gag caa     6852
Pro Val Pro Ser Leu Glu Ala Pro Ser Glu Gln Ala Pro Thr Glu Gln
            50                  55                  60

agg cct ggg gtg cag gag tgc tac cac gga aat gga cag agt tat caa     6900
Arg Pro Gly Val Gln Glu Cys Tyr His Gly Asn Gly Gln Ser Tyr Gln
        65                  70                  75

ggc aca tac ttc att act gtc aca gga aga acc tgc caa gct tgg tca     6948
Gly Thr Tyr Phe Ile Thr Val Thr Gly Arg Thr Cys Gln Ala Trp Ser
        80                  85                  90

tct atg aca cca cac tcg cat agt cgg acc cca gca tac tac cca aat     6996
Ser Met Thr Pro His Ser His Ser Arg Thr Pro Ala Tyr Tyr Pro Asn
95           •          100                 105                 110

gct ggc ttg atc aag aac tac tgc cga aat cca gat cct gtg gca gcc     7044
Ala Gly Leu Ile Lys Asn Tyr Cys Arg Asn Pro Asp Pro Val Ala Ala
                115                 120                 125

cct tgg tgt tat aca aca gat ccc agt gtc agg tgg gag tac tgc aac     7092
Pro Trp Cys Tyr Thr Thr Asp Pro Ser Val Arg Trp Glu Tyr Cys Asn
                130                 135                 140

ctg aca cga tgc tca gat gca gaa tgg act gcc ttc gtc cct ccg aat     7140
Leu Thr Arg Cys Ser Asp Ala Glu Trp Thr Ala Phe Val Pro Pro Asn
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299

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gag gaa acc ccc ggg gta cag gac tgc tac tac cat tat gga cag agt        7236
Glu Glu Thr Pro Gly Val Gln Asp Cys Tyr Tyr His Tyr Gly Gln Ser
175             180              185              190

tac cga ggc aca tac tcc acc act gtc aca gga aga act tgc caa gct        7284
Tyr Arg Gly Thr Tyr Ser Thr Thr Val Thr Gly Arg Thr Cys Gln Ala
                195              200              205

tgg tca tct atg aca cca cac cag cat agt cgg acc cca gaa aac tac        7332
Trp Ser Ser Met Thr Pro His Gln His Ser Arg Thr Pro Glu Asn Tyr
            210              215              220

cca aat gct ggc ctg acc agg aac tac tgc agg aat cca gat gct gag        7380
Pro Asn Ala Gly Leu Thr Arg Asn Tyr Cys Arg Asn Pro Asp Ala Glu
            225              230              235

att cgc cct tgg tgt tac acc atg gat ccc agt gtc agg tgg gag tac        7428
Ile Arg Pro Trp Cys Tyr Thr Met Asp Pro Ser Val Arg Trp Glu Tyr
    240              245              250

tgc aac ctg aca caa tgc ctg gtg aca gaa tca agt gtc ctt gca act        7476
Cys Asn Leu Thr Gln Cys Leu Val Thr Glu Ser Ser Val Leu Ala Thr
255              260              265              270

ctc acg gtg gtc cca gat cca agc aca gag gct tct tct gaa gaa gca        7524
Leu Thr Val Val Pro Asp Pro Ser Thr Glu Ala Ser Ser Glu Glu Ala
                275              280              285

cca acg gag caa agc ccc ggg gtc cag gat tgc tac cat ggt gat gga        7572
Pro Thr Glu Gln Ser Pro Gly Val Gln Asp Cys Tyr His Gly Asp Gly
            290              295              300

cag agt tat cga ggc tca ttc tct acc act gtc aca gga agg aca tgt        7620
Gln Ser Tyr Arg Gly Ser Phe Ser Thr Thr Val Thr Gly Arg Thr Cys
        305              310              315

cag tct tgg tcc tct atg aca cca cac tgg cat cag agg aca aca gaa        7668
Gln Ser Trp Ser Ser Met Thr Pro His Trp His Gln Arg Thr Thr Glu
    320              325              330

tat tat cca aat ggt ggc ctg acc agg aac tac tgc agg aat cca gat        7716
Tyr Tyr Pro Asn Gly Gly Leu Thr Arg Asn Tyr Cys Arg Asn Pro Asp
335              340              345              350

gct gag att agt cct tgg tgt tat acc atg gat ccc aat gtc aga tgg        7764
Ala Glu Ile Ser Pro Trp Cys Tyr Thr Met Asp Pro Asn Val Arg Trp
            355              360              365

gag tac tgc aac ctg aca caa tgt cca gtg aca gaa tca agt gtc ctt        7812
Glu Tyr Cys Asn Leu Thr Gln Cys Pro Val Thr Glu Ser Ser Val Leu
            370              375              380
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300

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Ala Thr Ser Thr Ala Val Ser Glu Gln Ala Pro Thr Glu Gln Ser Pro
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aca gtc cag gac tgc tac cat ggt gat gga cag agt tat cga ggc tca    7908
Thr Val Gln Asp Cys Tyr His Gly Asp Gly Gln Ser Tyr Arg Gly Ser
        400                 405                 410

ttc tcc acc act gtt aca gga agg aca tgt cag tct tgg tcc tct atg    7956
Phe Ser Thr Thr Val Thr Gly Arg Thr Cys Gln Ser Trp Ser Ser Met
415                 420                 425                 430

aca cca cac tgg cat cag aga acc aca gaa tac tac cca aat ggt ggc    8004
Thr Pro His Trp His Gln Arg Thr Thr Glu Tyr Tyr Pro Asn Gly Gly
                435                 440                 445

ctg acc agg aac tac tgc agg aat cca gat gct gag att cgc cct tgg    8052
Leu Thr Arg Asn Tyr Cys Arg Asn Pro Asp Ala Glu Ile Arg Pro Trp
        450                 455                 460

tgt tat acc atg gat ccc agt gtc aga tgg gag tac tgc aac ctg acg    8100
Cys Tyr Thr Met Asp Pro Ser Val Arg Trp Glu Tyr Cys Asn Leu Thr
        465                 470                 475

caa tgt cca gtg atg gaa tca act ctc ctc aca act ccc acg gtg gtc    8148
Gln Cys Pro Val Met Glu Ser Thr Leu Leu Thr Thr Pro Thr Val Val
480                 485                 490

cca gtt cca agc aca gag ctt cct tct gaa gaa gca cca act gaa aac    8196
Pro Val Pro Ser Thr Glu Leu Pro Ser Glu Glu Ala Pro Thr Glu Asn
495                 500                 505                 510

agc act ggg gtc cag gac tgc tac cga ggt gat gga cag agt tat cga    8244
Ser Thr Gly Val Gln Asp Cys Tyr Arg Gly Asp Gly Gln Ser Tyr Arg
                515                 520                 525

ggc aca ctc tcc acc act atc aca gga aga aca tgt cag tct tgg tcg    8292
Gly Thr Leu Ser Thr Thr Ile Thr Gly Arg Thr Cys Gln Ser Trp Ser
        530                 535                 540

tct atg aca cca cat tgg cat cgg agg atc cca tta tac tat cca aat    8340
Ser Met Thr Pro His Trp His Arg Arg Ile Pro Leu Tyr Tyr Pro Asn
        545                 550                 555

gct ggc ctg acc agg aac tac tgc agg aat cca gat gct gag att cgc    8388
Ala Gly Leu Thr Arg Asn Tyr Cys Arg Asn Pro Asp Ala Glu Ile Arg
        560                 565                 570

cct tgg tgt tac acc atg gat ccc agt gtc agg tgg gag tac tgc aac    8436
Pro Trp Cys Tyr Thr Met Asp Pro Ser Val Arg Trp Glu Tyr Cys Asn
575                 580                 585                 590

ctg aca cga tgt cca gtg aca gaa tcg agt gtc ctc aca act ccc aca    8484
Leu Thr Arg Cys Pro Val Thr Glu Ser Ser Val Leu Thr Thr Pro Thr
                595                 600                 605
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301

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gag aaa agc cct gtg gtc cag gat tgc tac cat ggt gat gga cgg agt        8580
Glu Lys Ser Pro Val Val Gln Asp Cys Tyr His Gly Asp Gly Arg Ser
            625                 630                 635

tat cga ggc ata tcc tcc acc act gtc aca gga agg acc tgt caa tct        8628
Tyr Arg Gly Ile Ser Ser Thr Thr Val Thr Gly Arg Thr Cys Gln Ser
    640                 645                 650

tgg tca tct atg ata cca cac tgg cat cag agg acc cca gaa aac tac        8676
Trp Ser Ser Met Ile Pro His Trp His Gln Arg Thr Pro Glu Asn Tyr
655                 660                 665                 670

cca aat gct ggc ctg acc gag aac tac tgc agg aat cca gat tct ggg        8724
Pro Asn Ala Gly Leu Thr Glu Asn Tyr Cys Arg Asn Pro Asp Ser Gly
                675                 680                 685

aaa caa ccc tgg tgt tac aca acc gat ccg tgt gtg agg tgg gag tac        8772
Lys Gln Pro Trp Cys Tyr Thr Thr Asp Pro Cys Val Arg Trp Glu Tyr
                690                 695                 700

tgc aat ctg aca caa tgc tca gaa aca gaa tca ggt gtc cta gag act        8820
Cys Asn Leu Thr Gln Cys Ser Glu Thr Glu Ser Gly Val Leu Glu Thr
            705                 710                 715

ccc act gtt gtt cca gtt cca agc atg gag gct cat tct gaa gca gca        8868
Pro Thr Val Val Pro Val Pro Ser Met Glu Ala His Ser Glu Ala Ala
    720                 725                 730

cca act gag caa acc cct gtg gtc cgg cag tgc tac cat ggt aat ggc        8916
Pro Thr Glu Gln Thr Pro Val Val Arg Gln Cys Tyr His Gly Asn Gly
735                 740                 745                 750

cag agt tat cga ggc aca ttc tcc acc act gtc aca gga agg aca tgt        8964
Gln Ser Tyr Arg Gly Thr Phe Ser Thr Thr Val Thr Gly Arg Thr Cys
                755                 760                 765

caa tct tgg tca tcc atg aca cca cac cgg cat cag agg acc cca gaa        9012
Gln Ser Trp Ser Ser Met Thr Pro His Arg His Gln Arg Thr Pro Glu
                770                 775                 780

aac tac cca aat gat ggc ctg aca atg aac tac tgc agg aat cca gat        9060
Asn Tyr Pro Asn Asp Gly Leu Thr Met Asn Tyr Cys Arg Asn Pro Asp
            785                 790                 795

gcc gat aca ggc cct tgg tgt ttt acc atg gac ccc agc atc agg tgg        9108
Ala Asp Thr Gly Pro Trp Cys Phe Thr Met Asp Pro Ser Ile Arg Trp
    800                 805                 810

gag tac tgc aac ctg acg cga tgc tca gac aca gaa ggg act gtg gtc        9156
Glu Tyr Cys Asn Leu Thr Arg Cys Ser Asp Thr Glu Gly Thr Val Val
815                 820                 825                 830
```

302

```
gct cct ccg act gtc atc cag gtt cca agc cta ggg cct cct tct gaa    9204
Ala Pro Pro Thr Val Ile Gln Val Pro Ser Leu Gly Pro Pro Ser Glu
            835                 840                 845

caa gac tgt atg ttt ggg aat ggg aaa gga tac cgg ggc aag aag gca    9252
Gln Asp Cys Met Phe Gly Asn Gly Lys Gly Tyr Arg Gly Lys Lys Ala
            850                 855                 860

acc act gtt act ggg acg cca tgc cag gaa tgg gct gcc cag gag ccc    9300
Thr Thr Val Thr Gly Thr Pro Cys Gln Glu Trp Ala Ala Gln Glu Pro
            865                 870                 875

cat aga cac agc acg ttc att cca ggg aca aat aaa tgg gca ggt ctg    9348
His Arg His Ser Thr Phe Ile Pro Gly Thr Asn Lys Trp Ala Gly Leu
        880                 885                 890

gaa aaa aat tac tgc cgt aac cct gat ggt gac atc aat ggt ccc tgg    9396
Glu Lys Asn Tyr Cys Arg Asn Pro Asp Gly Asp Ile Asn Gly Pro Trp
895                 900                 905                 910

tgc tac aca atg aat cca aga aaa ctt ttt gac tac tgt gat atc cct    9444
Cys Tyr Thr Met Asn Pro Arg Lys Leu Phe Asp Tyr Cys Asp Ile Pro
                    915                 920                 925

ctc tgt gca tcc tct tca ttt gat tgt ggg aag cct caa gtg gag ccg    9492
Leu Cys Ala Ser Ser Ser Phe Asp Cys Gly Lys Pro Gln Val Glu Pro
            930                 935                 940

aag aaa tgt cct gga agc att gta ggg ggg tgt gtg gcc cac cca cat    9540
Lys Lys Cys Pro Gly Ser Ile Val Gly Gly Cys Val Ala His Pro His
            945                 950                 955

tcc tgg ccc tgg caa gtc agt ctc aga aca agg ttt gga aag cac ttc    9588
Ser Trp Pro Trp Gln Val Ser Leu Arg Thr Arg Phe Gly Lys His Phe
    960                 965                 970

tgt gga ggc acc tta ata tcc cca gag tgg gtg ctg act gct gct cac    9636
Cys Gly Gly Thr Leu Ile Ser Pro Glu Trp Val Leu Thr Ala Ala His
975                 980                 985                 990

tgc ttg aag aag tcc tca agg cct tca tcc tac aag gtc atc ctg  ggt  9684
Cys Leu Lys Lys Ser Ser Arg Pro Ser Ser Tyr Lys Val Ile Leu  Gly
                995                 1000                1005

gca cac caa gaa gtg aac ctc gaa tct cat gtt cag gaa ata  gaa      9729
Ala His Gln Glu Val Asn Leu Glu Ser His Val Gln Glu Ile  Glu
            1010                1015                1020

gtg tct agg ctg ttc ttg gag ccc aca caa gca gat att gcc  ttg      9774
Val Ser Arg Leu Phe Leu Glu Pro Thr Gln Ala Asp Ile Ala  Leu
            1025                1030                1035

cta aag cta agc agg cct gcc gtc atc act gac aaa gta atg  cca      9819
Leu Lys Leu Ser Arg Pro Ala Val Ile Thr Asp Lys Val Met  Pro
            1040                1045                1050
```

303

```
gct tgt ctg cca  tcc cca gac tac atg  gtc acc gcc agg act  gaa          9864
Ala Cys Leu Pro  Ser Pro Asp Tyr Met  Val Thr Ala Arg Thr  Glu
            1055               1060               1065

tgt tac atc act  ggc tgg gga gaa acc  caa ggt acc ttt ggg  act          9909
Cys Tyr Ile Thr  Gly Trp Gly Glu Thr  Gln Gly Thr Phe Gly  Thr
            1070               1075               1080

ggc ctt ctc aag  gaa gcc cag ctc ctt  gtt att gag aat gaa  gtg          9954
Gly Leu Leu Lys  Glu Ala Gln Leu Leu  Val Ile Glu Asn Glu  Val
            1085               1090               1095

tgc aat cac tat  aag tat att tgt gct  gag cat ttg gcc aga  ggc          9999
Cys Asn His Tyr  Lys Tyr Ile Cys Ala  Glu His Leu Ala Arg  Gly
            1100               1105               1110

act gac agt tgc  cag ggt gac agt gga  ggg cct ctg gtt tgc  ttc          10044
Thr Asp Ser Cys  Gln Gly Asp Ser Gly  Gly Pro Leu Val Cys  Phe
            1115               1120               1125

gag aag gac aaa  tac att tta caa gga  gtc act tct tgg ggt  ctt          10089
Glu Lys Asp Lys  Tyr Ile Leu Gln Gly  Val Thr Ser Trp Gly  Leu
            1130               1135               1140

ggc tgt gca cgc  ccc aat aag cct ggt  gtc tat gct cgt gtt  tca          10134
Gly Cys Ala Arg  Pro Asn Lys Pro Gly  Val Tyr Ala Arg Val  Ser
            1145               1150               1155

agg ttt gtt act  tgg att gag gga atg  atg aga aat aat taa              10176
Arg Phe Val Thr  Trp Ile Glu Gly Met  Met Arg Asn Asn
            1160               1165


ttggacggga gacagagtga agcatcaacc tacttagaag ctgaaacgtg ggtaaggatt    10236

tagcatgctg gaaataatag acagcaatca aacgaagaca ctgttcccag ctaccagcta    10296

tgccaaacct tggcattttt ggtatttttg tgtataagct tttaaggtct gactgacaaa    10356

ttctgtatta aggtgtcata gctatgacat ttgttaaaaa taaactctgc acttattttg    10416

atttga                                                               10422
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<210> 126
<211> 1169
<212> PRT
<213> Homo sapiens

<400> 126

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Met Asn Tyr Cys Arg Asn Pro Asp Ala Val Ala Ala Pro Tyr Cys Tyr
1               5                   10                  15
```

304

```
Thr Arg Asp Pro Gly Val Arg Trp Glu Tyr Cys Asn Leu Thr Gln Cys
            20              25              30

Ser Asp Ala Glu Gly Thr Ala Val Ala Pro Pro Thr Val Thr Pro Val
            35              40              45

Pro Ser Leu Glu Ala Pro Ser Glu Gln Ala Pro Thr Glu Gln Arg Pro
    50              55              60

Gly Val Gln Glu Cys Tyr His Gly Asn Gly Gln Ser Tyr Gln Gly Thr
65              70              75              80

Tyr Phe Ile Thr Val Thr Gly Arg Thr Cys Gln Ala Trp Ser Ser Met
            85              90              95

Thr Pro His Ser His Ser Arg Thr Pro Ala Tyr Tyr Pro Asn Ala Gly
            100             105             110

Leu Ile Lys Asn Tyr Cys Arg Asn Pro Asp Pro Val Ala Ala Pro Trp
        115             120             125

Cys Tyr Thr Thr Asp Pro Ser Val Arg Trp Glu Tyr Cys Asn Leu Thr
    130             135             140

Arg Cys Ser Asp Ala Glu Trp Thr Ala Phe Val Pro Pro Asn Val Ile
145             150             155             160

Leu Ala Pro Ser Leu Glu Ala Phe Phe Glu Gln Ala Leu Thr Glu Glu
            165             170             175

Thr Pro Gly Val Gln Asp Cys Tyr Tyr His Tyr Gly Gln Ser Tyr Arg
        •   180             185             190

Gly Thr Tyr Ser Thr Thr Val Thr Gly Arg Thr Cys Gln Ala Trp Ser
    195             200             205

Ser Met Thr Pro His Gln His Ser Arg Thr Pro Glu Asn Tyr Pro Asn
    210             215             220

Ala Gly Leu Thr Arg Asn Tyr Cys Arg Asn Pro Asp Ala Glu Ile Arg
225             230             235             240
```

305

```
Pro Trp Cys Tyr Thr Met Asp Pro Ser Val Arg Trp Glu Tyr Cys Asn
              245             250                 255


Leu Thr Gln Cys Leu Val Thr Glu Ser Ser Val Leu Ala Thr Leu Thr
              260             265                 270


Val Val Pro Asp Pro Ser Thr Glu Ala Ser Ser Glu Glu Ala Pro Thr
              275             280                 285


Glu Gln Ser Pro Gly Val Gln Asp Cys Tyr His Gly Asp Gly Gln Ser
    290             295             300


Tyr Arg Gly Ser Phe Ser Thr Thr Val Thr Gly Arg Thr Cys Gln Ser
305             310             315                 320


Trp Ser Ser Met Thr Pro His Trp His Gln Arg Thr Thr Glu Tyr Tyr
              325             330                 335


Pro Asn Gly Gly Leu Thr Arg Asn Tyr Cys Arg Asn Pro Asp Ala Glu
              340             345             350


Ile Ser Pro Trp Cys Tyr Thr Met Asp Pro Asn Val Arg Trp Glu Tyr
              355             360             365


Cys Asn Leu Thr Gln Cys Pro Val Thr Glu Ser Ser Val Leu Ala Thr
    370             375             380


Ser Thr Ala Val Ser Glu Gln Ala Pro Thr Glu Gln Ser Pro Thr Val
385             390             395                 400


Gln Asp Cys Tyr His Gly Asp Gly Gln Ser Tyr Arg Gly Ser Phe Ser
              405             410                 415


Thr Thr Val Thr Gly Arg Thr Cys Gln Ser Trp Ser Ser Met Thr Pro
              420             425                 430


His Trp His Gln Arg Thr Thr Glu Tyr Tyr Pro Asn Gly Gly Leu Thr
              435             440                 445


Arg Asn Tyr Cys Arg Asn Pro Asp Ala Glu Ile Arg Pro Trp Cys Tyr
    450             455             460
```

306

Thr Met Asp Pro Ser Val Arg Trp Glu Tyr Cys Asn Leu Thr Gln Cys
465   470   475   480

Pro Val Met Glu Ser Thr Leu Leu Thr Thr Pro Thr Val Val Pro Val
              485   490   495

Pro Ser Thr Glu Leu Pro Ser Glu Glu Ala Pro Thr Glu Asn Ser Thr
              500   505   510

Gly Val Gln Asp Cys Tyr Arg Gly Asp Gly Gln Ser Tyr Arg Gly Thr
              515   520   525

Leu Ser Thr Thr Ile Thr Gly Arg Thr Cys Gln Ser Trp Ser Ser Met
              530   535   540

Thr Pro His Trp His Arg Arg Ile Pro Leu Tyr Tyr Pro Asn Ala Gly
545   550   555   560

Leu Thr Arg Asn Tyr Cys Arg Asn Pro Asp Ala Glu Ile Arg Pro Trp
              565   570   575

Cys Tyr Thr Met Asp Pro Ser Val Arg Trp Glu Tyr Cys Asn Leu Thr
              580   585   590

Arg Cys Pro Val Thr Glu Ser Ser Val Leu Thr Thr Pro Thr Val Ala
              595   600   605

Pro Val Pro Ser Thr Glu Ala Pro Ser Glu Gln Ala Pro Pro Glu Lys
              610   615   620

Ser Pro Val Val Gln Asp Cys Tyr His Gly Asp Gly Arg Ser Tyr Arg
625   630   635   640

Gly Ile Ser Ser Thr Thr Val Thr Gly Arg Thr Cys Gln Ser Trp Ser
              645   650   655

Ser Met Ile Pro His Trp His Gln Arg Thr Pro Glu Asn Tyr Pro Asn
              660   665   670

Ala Gly Leu Thr Glu Asn Tyr Cys Arg Asn Pro Asp Ser Gly Lys Gln
              675   680   685

307

```
Pro Trp Cys Tyr Thr Thr Asp Pro Cys Val Arg Trp Glu Tyr Cys Asn
    690                 695             700

Leu Thr Gln Cys Ser Glu Thr Glu Ser Gly Val Leu Glu Thr Pro Thr
705                 710             715                 720

Val Val Pro Val Pro Ser Met Glu Ala His Ser Glu Ala Ala Pro Thr
                725                 730                 735

Glu Gln Thr Pro Val Val Arg Gln Cys Tyr His Gly Asn Gly Gln Ser
            740             745             750

Tyr Arg Gly Thr Phe Ser Thr Thr Val Thr Gly Arg Thr Cys Gln Ser
        755             760             765

Trp Ser Ser Met Thr Pro His Arg His Gln Arg Thr Pro Glu Asn Tyr
    770             775             780

Pro Asn Asp Gly Leu Thr Met Asn Tyr Cys Arg Asn Pro Asp Ala Asp
785                 790             795                 800

Thr Gly Pro Trp Cys Phe Thr Met Asp Pro Ser Ile Arg Trp Glu Tyr
            805             810             815

Cys Asn Leu Thr Arg Cys Ser Asp Thr Glu Gly Thr Val Val Ala Pro
            820             825             830

Pro Thr Val Ile Gln Val Pro Ser Leu Gly Pro Pro Ser Glu Gln Asp
        835             840             845

Cys Met Phe Gly Asn Gly Lys Gly Tyr Arg Gly Lys Lys Ala Thr Thr
    850             855             860

Val Thr Gly Thr Pro Cys Gln Glu Trp Ala Ala Gln Glu Pro His Arg
865             870             875                 880

His Ser Thr Phe Ile Pro Gly Thr Asn Lys Trp Ala Gly Leu Glu Lys
                885             890             895

Asn Tyr Cys Arg Asn Pro Asp Gly Asp Ile Asn Gly Pro Trp Cys Tyr
            900             905             910
```

308

```
Thr Met Asn Pro Arg Lys Leu Phe Asp Tyr Cys Asp Ile Pro Leu Cys
        915             920             925

Ala Ser Ser Ser Phe Asp Cys Gly Lys Pro Gln Val Glu Pro Lys Lys
        930             935             940

Cys Pro Gly Ser Ile Val Gly Gly Cys Val Ala His Pro His Ser Trp
945             950             955             960

Pro Trp Gln Val Ser Leu Arg Thr Arg Phe Gly Lys His Phe Cys Gly
            965             970             975

Gly Thr Leu Ile Ser Pro Glu Trp Val Leu Thr Ala Ala His Cys Leu
        980             985             990

Lys Lys Ser Ser Arg Pro Ser Ser  Tyr Lys Val Ile Leu  Gly Ala His
        995             1000            1005

Gln Glu  Val Asn Leu Glu Ser  His Val Gln Glu Ile  Glu Val Ser
    1010            1015            1020

Arg Leu  Phe Leu Glu Pro Thr  Gln Ala Asp Ile Ala  Leu Leu Lys
    1025            1030            1035

Leu Ser  Arg Pro Ala Val Ile  Thr Asp Lys Val Met  Pro Ala Cys
    1040            1045            1050

Leu Pro  Ser Pro Asp Tyr Met  Val Thr Ala Arg Thr  Glu Cys Tyr
    1055            1060            1065

Ile Thr  Gly Trp Gly Glu Thr  Gln Gly Thr Phe Gly  Thr Gly Leu
    1070            1075            1080

Leu Lys  Glu Ala Gln Leu Leu  Val Ile Glu Asn Glu  Val Cys Asn
    1085            1090            1095

His Tyr  Lys Tyr Ile Cys Ala  Glu His Leu Ala Arg  Gly Thr Asp
    1100            1105            1110

Ser Cys  Gln Gly Asp Ser Gly  Gly Pro Leu Val Cys  Phe Glu Lys
    1115            1120            1125
```

309

```
Asp Lys  Tyr Ile Leu Gln Gly  Val Thr Ser Trp Gly  Leu Gly Cys
    1130                 1135             1140


Ala Arg  Pro Asn Lys Pro Gly  Val Tyr Ala Arg Val  Ser Arg Phe
    1145                 1150             1155


Val Thr  Trp Ile Glu Gly Met  Met Arg Asn Asn
    1160                 1165
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<210>  127
<211>  14070
<212>  DNA
<213>  Homo sapiens

<220>
<221>  CDS
<222>  (79)..(13770)
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<400>  127
gaggagcccg cccagccagc cagggccgcg aggccgaggc caggccgcag cccaggagcc      60

gccccaccgc agctggcg atg gac ccg ccg agg ccc gcg ctg ctg gcg ctg     111
                     Met Asp Pro Pro Arg Pro Ala Leu Leu Ala Leu
                     1               5                   10

ctg gcg ctg cct gcg ctg ctg ctg ctg ctg ctg gcg ggc gcc agg gcc     159
Leu Ala Leu Pro Ala Leu Leu Leu Leu Leu Leu Ala Gly Ala Arg Ala
            15              20              25

gaa gag gaa atg ctg gaa aat gtc agc ctg gtc tgt cca aaa gat gcg     207
Glu Glu Glu Met Leu Glu Asn Val Ser Leu Val Cys Pro Lys Asp Ala
        30              35              40

acc cga ttc aag cac ctc cgg aag tac aca tac aac tat gag gct gag     255
Thr Arg Phe Lys His Leu Arg Lys Tyr Thr Tyr Asn Tyr Glu Ala Glu
    45              50              55

agt tcc agt gga gtc cct ggg act gct gat tca aga agt gcc acc agg     303
Ser Ser Ser Gly Val Pro Gly Thr Ala Asp Ser Arg Ser Ala Thr Arg
60              65              70              75

atc aac tgc aag gtt gag ctg gag gtt ccc cag ctc tgc agc ttc atc     351
Ile Asn Cys Lys Val Glu Leu Glu Val Pro Gln Leu Cys Ser Phe Ile
            80              85              90

ctg aag acc agc cag tgc atc ctg aaa gag gtg tat ggc ttc aac cct     399
Leu Lys Thr Ser Gln Cys Ile Leu Lys Glu Val Tyr Gly Phe Asn Pro
            95              100             105
```

310

```
gag ggc aaa gcc ttg ctg aag aaa acc aag aac tct gag gag ttt gct      447
Glu Gly Lys Ala Leu Leu Lys Lys Thr Lys Asn Ser Glu Glu Phe Ala
        110             115             120

gca gcc atg tcc agg tat gag ctc aag ctg gcc att cca gaa ggg aag      495
Ala Ala Met Ser Arg Tyr Glu Leu Lys Leu Ala Ile Pro Glu Gly Lys
        125             130             135

cag gtt ttc ctt tac ccg gag aaa gat gaa cct act tac atc ctg aac      543
Gln Val Phe Leu Tyr Pro Glu Lys Asp Glu Pro Thr Tyr Ile Leu Asn
140             145             150             155

atc aag agg ggc atc att tct gcc ctc ctg gtt ccc cca gag aca gaa      591
Ile Lys Arg Gly Ile Ile Ser Ala Leu Leu Val Pro Pro Glu Thr Glu
                160             165             170

gaa gcc aag caa gtg ttg ttt ctg gat acc gtg tat gga aac tgc tcc      639
Glu Ala Lys Gln Val Leu Phe Leu Asp Thr Val Tyr Gly Asn Cys Ser
            175             180             185

act cac ttt acc gtc aag acg agg aag ggc aat gtg gca aca gaa ata      687
Thr His Phe Thr Val Lys Thr Arg Lys Gly Asn Val Ala Thr Glu Ile
        190             195             200

tcc act gaa aga gac ctg ggg cag tgt gat cgc ttc aag ccc atc cgc      735
Ser Thr Glu Arg Asp Leu Gly Gln Cys Asp Arg Phe Lys Pro Ile Arg
    205             210             215

aca ggc atc agc cca ctt gct ctc atc aaa ggc atg acc cgc ccc ttg      783
Thr Gly Ile Ser Pro Leu Ala Leu Ile Lys Gly Met Thr Arg Pro Leu
220             225             230             235

tca act ctg atc agc agc agc cag tcc tgt cag tac aca ctg gac gct      831
Ser Thr Leu Ile Ser Ser Ser Gln Ser Cys Gln Tyr Thr Leu Asp Ala
                240             245             250

aag agg aag cat gtg gca gaa gcc atc tgc aag gag caa cac ctc ttc      879
Lys Arg Lys His Val Ala Glu Ala Ile Cys Lys Glu Gln His Leu Phe
            255             260             265

ctg cct ttc tcc tac aag aat aag tat ggg atg gta gca caa gtg aca      927
Leu Pro Phe Ser Tyr Lys Asn Lys Tyr Gly Met Val Ala Gln Val Thr
        270             275             280

cag act ttg aaa ctt gaa gac aca cca aag atc aac agc cgc ttc ttt      975
Gln Thr Leu Lys Leu Glu Asp Thr Pro Lys Ile Asn Ser Arg Phe Phe
        285             290             295

ggt gaa ggt act aag aag atg ggc ctc gca ttt gag agc acc aaa tcc      1023
Gly Glu Gly Thr Lys Lys Met Gly Leu Ala Phe Glu Ser Thr Lys Ser
300             305             310             315

aca tca cct cca aag cag gcc gaa gct gtt ttg aag act gtc cag gaa      1071
Thr Ser Pro Pro Lys Gln Ala Glu Ala Val Leu Lys Thr Val Gln Glu
            320             325             330
```

311

```
ctg aaa aaa cta acc atc tct gag caa aat atc cag aga gct aat ctc    1119
Leu Lys Lys Leu Thr Ile Ser Glu Gln Asn Ile Gln Arg Ala Asn Leu
        335             340             345

ttc aat aag ctg gtt act gag ctg aga ggc ctc agt gat gaa gca gtc    1167
Phe Asn Lys Leu Val Thr Glu Leu Arg Gly Leu Ser Asp Glu Ala Val
        350             355             360

aca tct ctc ttg cca cag ctg att gag gtg tcc agc ccc atc act tta    1215
Thr Ser Leu Leu Pro Gln Leu Ile Glu Val Ser Ser Pro Ile Thr Leu
        365             370             375

caa gcc ttg gtt cag tgt gga cag cct cag tgc tcc act cac atc ctc    1263
Gln Ala Leu Val Gln Cys Gly Gln Pro Gln Cys Ser Thr His Ile Leu
380             385             390             395

cag tgg ctg aaa cgt gtg cat gcc aac ccc ctt ctg ata gat gtg gtc    1311
Gln Trp Leu Lys Arg Val His Ala Asn Pro Leu Leu Ile Asp Val Val
            400             405             410

acc tac ctg gtg gcc ctg atc ccc gag ccc tca gca cag cag ctg cga    1359
Thr Tyr Leu Val Ala Leu Ile Pro Glu Pro Ser Ala Gln Gln Leu Arg
            415             420             425

gag atc ttc aac atg gcg agg gat cag cgc agc cga gcc acc ttg tat    1407
Glu Ile Phe Asn Met Ala Arg Asp Gln Arg Ser Arg Ala Thr Leu Tyr
        430             435             440

gcg ctg agc cac gcg gtc aac aac tat cat aag aca aac cct aca ggg    1455
Ala Leu Ser His Ala Val Asn Asn Tyr His Lys Thr Asn Pro Thr Gly
        445             450             455

acc cag gag ctg ctg gac att gct aat tac ctg atg gaa cag att caa    1503
Thr Gln Glu Leu Leu Asp Ile Ala Asn Tyr Leu Met Glu Gln Ile Gln
460             465             470             475

gat gac tgc act ggg gat gaa gat tac acc tat ttg att ctg cgg gtc    1551
Asp Asp Cys Thr Gly Asp Glu Asp Tyr Thr Tyr Leu Ile Leu Arg Val
            480             485             490

att gga aat atg ggc caa acc atg gag cag tta act cca gaa ctc aag    1599
Ile Gly Asn Met Gly Gln Thr Met Glu Gln Leu Thr Pro Glu Leu Lys
        495             500             505

tct tca atc ctg aaa tgt gtc caa agt aca aag cca tca ctg atg atc    1647
Ser Ser Ile Leu Lys Cys Val Gln Ser Thr Lys Pro Ser Leu Met Ile
        510             515             520

cag aaa gct gcc atc cag gct ctg cgg aaa atg gag cct aaa gac aag    1695
Gln Lys Ala Ala Ile Gln Ala Leu Arg Lys Met Glu Pro Lys Asp Lys
        525             530             535

gac cag gag gtt ctt ctt cag act ttc ctt gat gat gct tct ccg gga    1743
Asp Gln Glu Val Leu Leu Gln Thr Phe Leu Asp Asp Ala Ser Pro Gly
540             545             550             555
```

312

```
gat aag cga ctg gct gcc tat ctt atg ttg atg agg agt cct tca cag       1791
Asp Lys Arg Leu Ala Ala Tyr Leu Met Leu Met Arg Ser Pro Ser Gln
            560             565                 570

gca gat att aac aaa att gtc caa att cta cca tgg gaa cag aat gag       1839
Ala Asp Ile Asn Lys Ile Val Gln Ile Leu Pro Trp Glu Gln Asn Glu
            575             580                 585

caa gtg aag aac ttt gtg gct tcc cat att gcc aat atc ttg aac tca       1887
Gln Val Lys Asn Phe Val Ala Ser His Ile Ala Asn Ile Leu Asn Ser
            590             595                 600

gaa gaa ttg gat atc caa gat ctg aaa aag tta gtg aaa gaa gtt ctg       1935
Glu Glu Leu Asp Ile Gln Asp Leu Lys Lys Leu Val Lys Glu Val Leu
    605             610             615

aaa gaa tct caa ctt cca act gtc atg gac ttc aga aaa ttc tct cgg       1983
Lys Glu Ser Gln Leu Pro Thr Val Met Asp Phe Arg Lys Phe Ser Arg
620             625                 630             635

aac tat caa ctc tac aaa tct gtt tct att cca tca ctt gac cca gcc       2031
Asn Tyr Gln Leu Tyr Lys Ser Val Ser Ile Pro Ser Leu Asp Pro Ala
                640             645                 650

tca gcc aaa ata gaa ggg aat ctt ata ttt gat cca aat aac tac ctt       2079
Ser Ala Lys Ile Glu Gly Asn Leu Ile Phe Asp Pro Asn Asn Tyr Leu
            655             660                 665

cct aaa gaa agc atg ctg aaa act acc ctc act gcc ttt gga ttt gct       2127
Pro Lys Glu Ser Met Leu Lys Thr Thr Leu Thr Ala Phe Gly Phe Ala
            670             675                 680

tca gct gac ctc atc gag att ggc ttg gaa gga aaa ggc ttt gag cca       2175
Ser Ala Asp Leu Ile Glu Ile Gly Leu Glu Gly Lys Gly Phe Glu Pro
    685             690                 695

aca ttg gaa gct ctt ttt ggg aag caa gga ttt ttc cca gac agt gtc       2223
Thr Leu Glu Ala Leu Phe Gly Lys Gln Gly Phe Phe Pro Asp Ser Val
700             705             710                 715

aac aaa gct ttg tac tgg gtt aat ggt caa gtt cct gat ggt gtc tct       2271
Asn Lys Ala Leu Tyr Trp Val Asn Gly Gln Val Pro Asp Gly Val Ser
            720             725                 730

aag gtc tta gtg gac cac ttt ggc tat acc aaa gat gat aaa cat gag       2319
Lys Val Leu Val Asp His Phe Gly Tyr Thr Lys Asp Asp Lys His Glu
            735             740                 745

cag gat atg gta aat gga ata atg ctc agt gtt gag aag ctg att aaa       2367
Gln Asp Met Val Asn Gly Ile Met Leu Ser Val Glu Lys Leu Ile Lys
            750             755                 760

gat ttg aaa tcc aaa gaa gtc ccg gaa gcc aga gcc tac ctc cgc atc       2415
Asp Leu Lys Ser Lys Glu Val Pro Glu Ala Arg Ala Tyr Leu Arg Ile
    765             770                 775
```

313

```
ttg gga gag gag ctt ggt ttt gcc agt ctc cat gac ctc cag ctc ctg      2463
Leu Gly Glu Glu Leu Gly Phe Ala Ser Leu His Asp Leu Gln Leu Leu
780             785             790                 795

gga aag ctg ctt ctg atg ggt gcc cgc act ctg cag ggg atc ccc cag      2511
Gly Lys Leu Leu Leu Met Gly Ala Arg Thr Leu Gln Gly Ile Pro Gln
                800             805                 810

atg att gga gag gtc atc agg aag ggc tca aag aat gac ttt ttt ctt      2559
Met Ile Gly Glu Val Ile Arg Lys Gly Ser Lys Asn Asp Phe Phe Leu
            815             820             825

cac tac atc ttc atg gag aat gcc ttt gaa ctc ccc act gga gct gga      2607
His Tyr Ile Phe Met Glu Asn Ala Phe Glu Leu Pro Thr Gly Ala Gly
            830             835             840

tta cag ttg caa ata tct tca tct gga gtc att gct ccc gga gcc aag      2655
Leu Gln Leu Gln Ile Ser Ser Ser Gly Val Ile Ala Pro Gly Ala Lys
    845             850             855

gct gga gta aaa ctg gaa gta gcc aac atg cag gct gaa ctg gtg gca      2703
Ala Gly Val Lys Leu Glu Val Ala Asn Met Gln Ala Glu Leu Val Ala
860             865             870                 875

aaa ccc tcc gtg tct gtg gag ttt gtg aca aat atg ggc atc atc att      2751
Lys Pro Ser Val Ser Val Glu Phe Val Thr Asn Met Gly Ile Ile Ile
                880             885                 890

ccg gac ttc gct agg agt ggg gtc cag atg aac acc aac ttc ttc cac      2799
Pro Asp Phe Ala Arg Ser Gly Val Gln Met Asn Thr Asn Phe Phe His
            895             900             905

gag tcg ggt ctg gag gct cat gtt gcc cta aaa cct ggg aag ctg aag      2847
Glu Ser Gly Leu Glu Ala His Val Ala Leu Lys Pro Gly Lys Leu Lys
        910             915             920

ttt atc att cct tcc cca aag aga cca gtc aag ctg ctc agt gga ggc      2895
Phe Ile Ile Pro Ser Pro Lys Arg Pro Val Lys Leu Leu Ser Gly Gly
    925             930             935

aac aca tta cat ttg gtc tct acc acc aaa acg gag gtg atc cca cct      2943
Asn Thr Leu His Leu Val Ser Thr Thr Lys Thr Glu Val Ile Pro Pro
940             945             950                 955

ctc att gag aac agg cag tcc tgg tca gtt tgc aag caa gtc ttt cct      2991
Leu Ile Glu Asn Arg Gln Ser Trp Ser Val Cys Lys Gln Val Phe Pro
                960             965                 970

ggc ctg aat tac tgc acc tca ggc gct tac tcc aac gcc agc tcc aca      3039
Gly Leu Asn Tyr Cys Thr Ser Gly Ala Tyr Ser Asn Ala Ser Ser Thr
            975             980             985

gac tcc gcc tcc tac tat ccg ctg acc ggg gac acc aga  tta gag ctg     3087
Asp Ser Ala Ser Tyr Tyr Pro Leu Thr Gly Asp Thr Arg  Leu Glu Leu
        990             995             1000
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314

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gaa ctg  agg cct aca gga gag  att gag cag tat tct  gtc agc gca      3132
Glu Leu  Arg Pro Thr Gly Glu  Ile Glu Gln Tyr Ser  Val Ser Ala
    1005             1010              1015

acc tat  gag ctc cag aga gag  gac aga gcc ttg gtg  gat acc ctg      3177
Thr Tyr  Glu Leu Gln Arg Glu  Asp Arg Ala Leu Val  Asp Thr Leu
    1020             1025              1030

aag ttt  gta act caa gca gaa  ggt gcg aag cag act  gag gct acc      3222
Lys Phe  Val Thr Gln Ala Glu  Gly Ala Lys Gln Thr  Glu Ala Thr
    1035             1040              1045

atg aca  ttc aaa tat aat cgg  cag agt atg acc ttg  tcc agt gaa      3267
Met Thr  Phe Lys Tyr Asn Arg  Gln Ser Met Thr Leu  Ser Ser Glu
    1050             1055              1060

gtc caa  att ccg gat ttt gat  gtt gac ctc gga aca  atc ctc aga      3312
Val Gln  Ile Pro Asp Phe Asp  Val Asp Leu Gly Thr  Ile Leu Arg
    1065             1070              1075

gtt aat  gat gaa tct act gag  ggc aaa acg tct tac  aga ctc acc      3357
Val Asn  Asp Glu Ser Thr Glu  Gly Lys Thr Ser Tyr  Arg Leu Thr
    1080             1085              1090

ctg gac  att cag aac aag aaa  att act gag gtc gcc  ctc atg ggc      3402
Leu Asp  Ile Gln Asn Lys Lys  Ile Thr Glu Val Ala  Leu Met Gly
    1095             1100              1105

cac cta  agt tgt gac aca aag  gaa gaa aga aaa atc  aag ggt gtt      3447
His Leu  Ser Cys Asp Thr Lys  Glu Glu Arg Lys Ile  Lys Gly Val
    1110             1115              1120

att tcc  ata ccc cgt ttg caa  gca gaa gcc aga agt  gag atc ctc      3492
Ile Ser  Ile Pro Arg Leu Gln  Ala Glu Ala Arg Ser  Glu Ile Leu
    1125             1130              1135

gcc cac  tgg tcg cct gcc aaa  ctg ctt ctc caa atg  gac tca tct      3537
Ala His  Trp Ser Pro Ala Lys  Leu Leu Leu Gln Met  Asp Ser Ser
    1140             1145              1150

gct aca  gct tat ggc tcc aca  gtt tcc aag agg gtg  gca tgg cat      3582
Ala Thr  Ala Tyr Gly Ser Thr  Val Ser Lys Arg Val  Ala Trp His
    1155             1160              1165

tat gat  gaa gag aag att gaa  ttt gaa tgg aac aca  ggc acc aat      3627
Tyr Asp  Glu Glu Lys Ile Glu  Phe Glu Trp Asn Thr  Gly Thr Asn
    1170             1175              1180

gta gat  acc aaa aaa atg act  tcc aat ttc cct gtg  gat ctc tcc      3672
Val Asp  Thr Lys Lys Met Thr  Ser Asn Phe Pro Val  Asp Leu Ser
    1185             1190              1195

gat tat  cct aag agc ttg cat  atg tat gct aat aga  ctc ctg gat      3717
Asp Tyr  Pro Lys Ser Leu His  Met Tyr Ala Asn Arg  Leu Leu Asp
    1200             1205              1210
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315

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cac aga gtc cct caa aca gac  atg act ttc cgg cac  gtg ggt tcc      3762
His Arg Val Pro Gln Thr Asp  Met Thr Phe Arg His  Val Gly Ser
    1215             1220              1225

aaa tta ata gtt gca atg agc  tca tgg ctt cag aag  gca tct ggg      3807
Lys Leu Ile Val Ala Met Ser  Ser Trp Leu Gln Lys  Ala Ser Gly
    1230             1235              1240

agt ctt cct tat acc cag act  ttg caa gac cac ctc  aat agc ctg      3852
Ser Leu Pro Tyr Thr Gln Thr  Leu Gln Asp His Leu  Asn Ser Leu
    1245             1250              1255

aag gag ttc aac ctc cag aac  atg gga ttg cca gac  ttc cac atc      3897
Lys Glu Phe Asn Leu Gln Asn  Met Gly Leu Pro Asp  Phe His Ile
    1260             1265              1270

cca gaa aac ctc ttc tta aaa  agc gat ggc cgg gtc  aaa tat acc      3942
Pro Glu Asn Leu Phe Leu Lys  Ser Asp Gly Arg Val  Lys Tyr Thr
    1275             1280              1285

ttg aac aag aac agt ttg aaa  att gag att cct ttg  cct ttt ggt      3987
Leu Asn Lys Asn Ser Leu Lys  Ile Glu Ile Pro Leu  Pro Phe Gly
    1290             1295              1300

ggc aaa tcc tcc aga gat cta  aag atg tta gag act  gtt agg aca      4032
Gly Lys Ser Ser Arg Asp Leu  Lys Met Leu Glu Thr  Val Arg Thr
    1305             1310              1315

cca gcc ctc cac ttc aag tct  gtg gga ttc cat ctg  cca tct cga      4077
Pro Ala Leu His Phe Lys Ser  Val Gly Phe His Leu  Pro Ser Arg
    1320             1325              1330

gag ttc caa gtc cct act ttt  acc att ccc aag ttg  tat caa ctg      4122
Glu Phe Gln Val Pro Thr Phe  Thr Ile Pro Lys Leu  Tyr Gln Leu
    1335             1340              1345

caa gtg cct ctc ctg ggt gtt  cta gac ctc tcc acg  aat gtc tac      4167
Gln Val Pro Leu Leu Gly Val  Leu Asp Leu Ser Thr  Asn Val Tyr
    1350             1355              1360

agc aac ttg tac aac tgg tcc  gcc tcc tac agt ggt  ggc aac acc      4212
Ser Asn Leu Tyr Asn Trp Ser  Ala Ser Tyr Ser Gly  Gly Asn Thr
    1365             1370              1375

agc aca gac cat ttc agc ctt  cgg gct cgt tac cac  atg aag gct      4257
Ser Thr Asp His Phe Ser Leu  Arg Ala Arg Tyr His  Met Lys Ala
    1380             1385              1390

gac tct gtg gtt gac ctg ctt  tcc tac aat gtg caa  gga tct gga      4302
Asp Ser Val Val Asp Leu Leu  Ser Tyr Asn Val Gln  Gly Ser Gly
    1395             1400              1405

gaa aca aca tat gac cac aag  aat acg ttc aca cta  tca tgt gat      4347
Glu Thr Thr Tyr Asp His Lys  Asn Thr Phe Thr Leu  Ser Cys Asp
    1410             1415              1420
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316

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ggg tct  cta cgc cac aaa ttt  cta gat tcg aat atc  aaa ttc agt        4392
Gly Ser  Leu Arg His Lys Phe  Leu Asp Ser Asn Ile  Lys Phe Ser
    1425             1430                1435

cat gta  gaa aaa ctt gga aac  aac cca gtc tca aaa  ggt tta cta        4437
His Val  Glu Lys Leu Gly Asn  Asn Pro Val Ser Lys  Gly Leu Leu
    1440             1445                1450

ata ttc  gat gca tct agt tcc  tgg gga cca cag atg  tct gct tca        4482
Ile Phe  Asp Ala Ser Ser Ser  Trp Gly Pro Gln Met  Ser Ala Ser
    1455             1460                1465

gtt cat  ttg gac tcc aaa aag  aaa cag cat ttg ttt  gtc aaa gaa        4527
Val His  Leu Asp Ser Lys Lys  Lys Gln His Leu Phe  Val Lys Glu
    1470             1475                1480

gtc aag  att gat ggg cag ttc  aga gtc tct tcg ttc  tat gct aaa        4572
Val Lys  Ile Asp Gly Gln Phe  Arg Val Ser Ser Phe  Tyr Ala Lys
    1485             1490                1495

ggc aca  tat ggc ctg tct tgt  cag agg gat cct aac  act ggc cgg        4617
Gly Thr  Tyr Gly Leu Ser Cys  Gln Arg Asp Pro Asn  Thr Gly Arg
    1500             1505                1510

ctc aat  gga gag tcc aac ctg  agg ttt aac tcc tcc  tac ctc caa        4662
Leu Asn  Gly Glu Ser Asn Leu  Arg Phe Asn Ser Ser  Tyr Leu Gln
    1515             1520                1525

ggc acc  aac cag ata aca gga  aga tat gaa gat gga  acc ctc tcc        4707
Gly Thr  Asn Gln Ile Thr Gly  Arg Tyr Glu Asp Gly  Thr Leu Ser
    1530             1535                1540

ctc acc  tcc acc tct gat ctg  caa agt ggc atc att  aaa aat act        4752
Leu Thr  Ser Thr Ser Asp Leu  Gln Ser Gly Ile Ile  Lys Asn Thr
    1545             1550                1555

gct tcc  cta aag tat gag aac  tac gag ctg act tta  aaa tct gac        4797
Ala Ser  Leu Lys Tyr Glu Asn  Tyr Glu Leu Thr Leu  Lys Ser Asp
    1560             1565                1570

acc aat  ggg aag tat aag aac  ttt gcc act tct aac  aag atg gat        4842
Thr Asn  Gly Lys Tyr Lys Asn  Phe Ala Thr Ser Asn  Lys Met Asp
    1575             1580                1585

atg acc  ttc tct aag caa aat  gca ctg ctg cgt tct  gaa tat cag        4887
Met Thr  Phe Ser Lys Gln Asn  Ala Leu Leu Arg Ser  Glu Tyr Gln
    1590             1595                1600

gct gat  tac gag tca ttg agg  ttc ttc agc ctg ctt  tct gga tca        4932
Ala Asp  Tyr Glu Ser Leu Arg  Phe Phe Ser Leu Leu  Ser Gly Ser
    1605             1610                1615

cta aat  tcc cat ggt ctt gag  tta aat gct gac atc  tta ggc act        4977
Leu Asn  Ser His Gly Leu Glu  Leu Asn Ala Asp Ile  Leu Gly Thr
    1620             1625                1630
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317

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gac aaa att aat agt ggt gct  cac aag gcg aca cta  agg att ggc   5022
Asp Lys Ile Asn Ser Gly Ala  His Lys Ala Thr Leu  Arg Ile Gly
    1635            1640          1645

caa gat gga ata tct acc agt  gca acg acc aac ttg  aag tgt agt   5067
Gln Asp Gly Ile Ser Thr Ser  Ala Thr Thr Asn Leu  Lys Cys Ser
    1650            1655          1660

ctc ctg gtg ctg gag aat gag  ctg aat gca gag ctt  ggc ctc tct   5112
Leu Leu Val Leu Glu Asn Glu  Leu Asn Ala Glu Leu  Gly Leu Ser
    1665            1670          1675

ggg gca tct atg aaa tta aca  aca aat ggc cgc ttc  agg gaa cac   5157
Gly Ala Ser Met Lys Leu Thr  Thr Asn Gly Arg Phe  Arg Glu His
    1680            1685          1690

aat gca aaa ttc agt ctg gat  ggg aaa gcc gcc ctc  aca gag cta   5202
Asn Ala Lys Phe Ser Leu Asp  Gly Lys Ala Ala Leu  Thr Glu Leu
    1695            1700          1705

tca ctg gga agt gct tat cag  gcc atg att ctg ggt  gtc gac agc   5247
Ser Leu Gly Ser Ala Tyr Gln  Ala Met Ile Leu Gly  Val Asp Ser
    1710            1715          1720

aaa aac att ttc aac ttc aag  gtc agt caa gaa gga  ctt aag ctc   5292
Lys Asn Ile Phe Asn Phe Lys  Val Ser Gln Glu Gly  Leu Lys Leu
    1725            1730          1735

tca aat gac atg atg ggc tca  tat gct gaa atg aaa  ttt gac cac   5337
Ser Asn Asp Met Met Gly Ser  Tyr Ala Glu Met Lys  Phe Asp His
    1740            1745          1750

aca aac agt ctg aac att gca  ggc tta tca ctg gac  ttc tct tca   5382
Thr Asn Ser Leu Asn Ile Ala  Gly Leu Ser Leu Asp  Phe Ser Ser
    1755            1760          1765

aaa ctt gac aac att tac agc  tct gac aag ttt tat  aag caa act   5427
Lys Leu Asp Asn Ile Tyr Ser  Ser Asp Lys Phe Tyr  Lys Gln Thr
    1770            1775          1780

gtt aat tta cag cta cag ccc  tat tct ctg gta act  act tta aac   5472
Val Asn Leu Gln Leu Gln Pro  Tyr Ser Leu Val Thr  Thr Leu Asn
    1785            1790          1795

agt gac ctg aaa tac aat gct  ctg gat ctc acc aac  aat ggg aaa   5517
Ser Asp Leu Lys Tyr Asn Ala  Leu Asp Leu Thr Asn  Asn Gly Lys
    1800            1805          1810

cta cgg cta gaa ccc ctg aag  ctg cat gtg gct ggt  aac cta aaa   5562
Leu Arg Leu Glu Pro Leu Lys  Leu His Val Ala Gly  Asn Leu Lys
    1815            1820          1825

gga gcc tac caa aat aat gaa  ata aaa cac atc tat  gcc atc tct   5607
Gly Ala Tyr Gln Asn Asn Glu  Ile Lys His Ile Tyr  Ala Ile Ser
    1830            1835          1840
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318

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tct gct  gcc tta tca gca agc  tat aaa gca gac act  gtt gct aag      5652
Ser Ala  Ala Leu Ser Ala Ser  Tyr Lys Ala Asp Thr  Val Ala Lys
    1845             1850              1855

gtt cag  ggt gtg gag ttt agc  cat cgg ctc aac aca  gac atc gct      5697
Val Gln  Gly Val Glu Phe Ser  His Arg Leu Asn Thr  Asp Ile Ala
    1860             1865              1870

ggg ctg  gct tca gcc att gac  atg agc aca aac tat  aat tca gac      5742
Gly Leu  Ala Ser Ala Ile Asp  Met Ser Thr Asn Tyr  Asn Ser Asp
    1875             1880              1885

tca ctg  cat ttc agc aat gtc  ttc cgt tct gta atg  gcc ccg ttt      5787
Ser Leu  His Phe Ser Asn Val  Phe Arg Ser Val Met  Ala Pro Phe
    1890             1895              1900

acc atg  acc atc gat gca cat  aca aat ggc aat ggg  aaa ctc gct      5832
Thr Met  Thr Ile Asp Ala His  Thr Asn Gly Asn Gly  Lys Leu Ala
    1905             1910              1915

ctc tgg  gga gaa cat act ggg  cag ctg tat agc aaa  ttc ctg ttg      5877
Leu Trp  Gly Glu His Thr Gly  Gln Leu Tyr Ser Lys  Phe Leu Leu
    1920             1925              1930

aaa gca  gaa cct ctg gca ttt  act ttc tct cat gat  tac aaa ggc      5922
Lys Ala  Glu Pro Leu Ala Phe  Thr Phe Ser His Asp  Tyr Lys Gly
    1935             1940              1945

tcc aca  agt cat cat ctc gtg  tct agg aaa agc atc  agt gca gct      5967
Ser Thr  Ser His His Leu Val  Ser Arg Lys Ser Ile  Ser Ala Ala
    1950             1955              1960

ctt gaa  cac aaa gtc agt gcc  ctg ctt act cca gct  gag cag aca      6012
Leu Glu  His Lys Val Ser Ala  Leu Leu Thr Pro Ala  Glu Gln Thr
    1965             1970              1975

ggc acc  tgg aaa ctc aag acc  caa ttt aac aac aat  gaa tac agc      6057
Gly Thr  Trp Lys Leu Lys Thr  Gln Phe Asn Asn Asn  Glu Tyr Ser
    1980             1985              1990

cag gac  ttg gat gct tac aac  act aaa gat aaa att  ggc gtg gag      6102
Gln Asp  Leu Asp Ala Tyr Asn  Thr Lys Asp Lys Ile  Gly Val Glu
    1995             2000              2005

ctt act  gga cga act ctg gct  gac cta act cta cta  gac tcc cca      6147
Leu Thr  Gly Arg Thr Leu Ala  Asp Leu Thr Leu Leu  Asp Ser Pro
    2010             2015              2020

att aaa  gtg cca ctt tta ctc  agt gag ccc atc aat  atc att gat      6192
Ile Lys  Val Pro Leu Leu Leu  Ser Glu Pro Ile Asn  Ile Ile Asp
    2025             2030              2035

gct tta  gag atg aga gat gcc  gtt gag aag ccc caa  gaa ttt aca      6237
Ala Leu  Glu Met Arg Asp Ala  Val Glu Lys Pro Gln  Glu Phe Thr
    2040             2045              2050
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gaa aaa ctg cag cag ctt aag  aga cac ata cag aat  ata gac atc      6912
Glu Lys Leu Gln Gln Leu Lys  Arg His Ile Gln Asn  Ile Asp Ile
        2265                 2270                 2275

cag cac cta gct gga aag tta  aaa caa cac att gag  gct att gat.     6957
Gln His Leu Ala Gly Lys Leu  Lys Gln His Ile Glu  Ala Ile Asp
        2280                 2285                 2290

gtt aga gtg ctt tta gat caa  ttg gga act aca att  tca ttt gaa      7002
Val Arg Val Leu Leu Asp Gln  Leu Gly Thr Thr Ile  Ser Phe Glu
       2295                  2300                 2305

aga ata aat gat gtt ctt gag  cat gtc aaa cac ttt  gtt ata aat      7047
Arg Ile Asn Asp Val Leu Glu  His Val Lys His Phe  Val Ile Asn
        2310                 2315                 2320

ctt att ggg gat ttt gaa gta  gct gag aaa atc aat  gcc ttc aga      7092
Leu Ile Gly Asp Phe Glu Val  Ala Glu Lys Ile Asn  Ala Phe Arg
        2325                 2330                 2335

gcc aaa gtc cat gag tta atc  gag agg tat gaa gta  gac caa caa      7137
Ala Lys Val His Glu Leu Ile  Glu Arg Tyr Glu Val  Asp Gln Gln
        2340                 2345                 2350

atc cag gtt tta atg gat aaa  tta gta gag ttg gcc  cac caa tac      7182
Ile Gln Val Leu Met Asp Lys  Leu Val Glu Leu Ala  His Gln Tyr
        2355                 2360                 2365

aag ttg aag gag act att cag  aag cta agc aat gtc  cta caa caa      7227
Lys Leu Lys Glu Thr Ile Gln  Lys Leu Ser Asn Val  Leu Gln Gln
        2370                 2375                 2380

gtt aag ata aaa gat tac ttt  gag aaa ttg gtt gga  ttt att gat      7272
Val Lys Ile Lys Asp Tyr Phe  Glu Lys Leu Val Gly  Phe Ile Asp
        2385                 2390                 2395

gat gct gtc aag aag ctt aat  gaa tta tct ttt aaa  aca ttc att      7317
Asp Ala Val Lys Lys Leu Asn  Glu Leu Ser Phe Lys  Thr Phe Ile
        2400                 2405                 2410

gaa gat gtt aac aaa ttc ctt  gac atg ttg ata aag  aaa tta aag      7362
Glu Asp Val Asn Lys Phe Leu  Asp Met Leu Ile Lys  Lys Leu Lys
        2415                 2420                 2425

tca ttt gat tac cac cag ttt  gta gat gaa acc aat  gac aaa atc      7407
Ser Phe Asp Tyr His Gln Phe  Val Asp Glu Thr Asn  Asp Lys Ile
        2430                 2435                 2440

cgt gag gtg act cag aga ctc  aat ggt gaa att cag  gct ctg gaa      7452
Arg Glu Val Thr Gln Arg Leu  Asn Gly Glu Ile Gln  Ala Leu Glu
        2445                 2450                 2455

cta cca caa aaa gct gaa gca  tta aaa ctg ttt tta  gag gaa acc      7497
Leu Pro Gln Lys Ala Glu Ala  Leu Lys Leu Phe Leu  Glu Glu Thr
        2460                 2465                 2470
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321

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aag gcc  aca gtt gca gtg tat  ctg gaa agc cta cag  gac acc aaa      7542
Lys Ala  Thr Val Ala Val Tyr  Leu Glu Ser Leu Gln  Asp Thr Lys
    2475             2480               2485

ata acc  tta atc atc aat tgg  tta cag gag gct tta  agt tca gca      7587
Ile Thr  Leu Ile Ile Asn Trp  Leu Gln Glu Ala Leu  Ser Ser Ala
    2490             2495               2500

tct ttg  gct cac atg aag gcc  aaa ttc cga gag act  cta gaa gat      7632
Ser Leu  Ala His Met Lys Ala  Lys Phe Arg Glu Thr  Leu Glu Asp
    2505             2510               2515

aca cga  gac cga atg tat caa  atg gac att cag cag  gaa ctt caa      7677
Thr Arg  Asp Arg Met Tyr Gln  Met Asp Ile Gln Gln  Glu Leu Gln
    2520             2525               2530

cga tac  ctg tct ctg gta ggc  cag gtt tat agc aca  ctt gtc acc      7722
Arg Tyr  Leu Ser Leu Val Gly  Gln Val Tyr Ser Thr  Leu Val Thr
    2535             2540               2545

tac att  tct gat tgg tgg act  ctt gct gct aag aac  ctt act gac      7767
Tyr Ile  Ser Asp Trp Trp Thr  Leu Ala Ala Lys Asn  Leu Thr Asp
    2550             2555               2560

ttt gca  gag caa tat tct atc  caa gat tgg gct aaa  cgt atg aaa      7812
Phe Ala  Glu Gln Tyr Ser Ile  Gln Asp Trp Ala Lys  Arg Met Lys
    2565             2570               2575

gca ttg  gta gag caa ggg ttc  act gtt cct gaa atc  aag acc atc      7857
Ala Leu  Val Glu Gln Gly Phe  Thr Val Pro Glu Ile  Lys Thr Ile
    2580             2585               2590

ctt ggg  acc atg cct gcc ttt  gaa gtc agt ctt cag  gct ctt cag      7902
Leu Gly  Thr Met Pro Ala Phe  Glu Val Ser Leu Gln  Ala Leu Gln
    2595             2600               2605

aaa gct  acc ttc cag aca cct  gat ttt ata gtc ccc  cta aca gat      7947
Lys Ala  Thr Phe Gln Thr Pro  Asp Phe Ile Val Pro  Leu Thr Asp
    2610             2615               2620

ttg agg  att cca tca gtt cag  ata aac ttc aaa gac  tta aaa aat      7992
Leu Arg  Ile Pro Ser Val Gln  Ile Asn Phe Lys Asp  Leu Lys Asn
    2625             2630               2635

ata aaa  atc cca tcc agg ttt  tcc aca cca gaa ttt  acc atc ctt      8037
Ile Lys  Ile Pro Ser Arg Phe  Ser Thr Pro Glu Phe  Thr Ile Leu
    2640             2645               2650

aac acc  ttc cac att cct tcc  ttt aca att gac ttt  gta gaa atg      8082
Asn Thr  Phe His Ile Pro Ser  Phe Thr Ile Asp Phe  Val Glu Met
    2655             2660               2665

aaa gta  aag atc atc aga acc  att gac cag atg ctg  aac agt gag      8127
Lys Val  Lys Ile Ile Arg Thr  Ile Asp Gln Met Leu  Asn Ser Glu
    2670             2675               2680
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322

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ctg cag tgg ccc gtt cca gat ata tat ctc agg gat ctg aag gtg          8172
Leu Gln Trp Pro Val Pro Asp Ile Tyr Leu Arg Asp Leu Lys Val
    2685                2690                2695

gag gac att cct cta gcg aga atc acc ctg cca gac ttc cgt tta          8217
Glu Asp Ile Pro Leu Ala Arg Ile Thr Leu Pro Asp Phe Arg Leu
    2700                2705                2710

cca gaa atc gca att cca gaa ttc ata atc cca act ctc aac ctt          8262
Pro Glu Ile Ala Ile Pro Glu Phe Ile Ile Pro Thr Leu Asn Leu
    2715                2720                2725

aat gat ttt caa gtt cct gac ctt cac ata cca gaa ttc cag ctt          8307
Asn Asp Phe Gln Val Pro Asp Leu His Ile Pro Glu Phe Gln Leu
    2730                2735                2740

ccc cac atc tca cac aca att gaa gta cct act ttt ggc aag cta          8352
Pro His Ile Ser His Thr Ile Glu Val Pro Thr Phe Gly Lys Leu
    2745                2750                2755

tac agt att ctg aaa atc caa tct cct ctt ttc aca tta gat gca          8397
Tyr Ser Ile Leu Lys Ile Gln Ser Pro Leu Phe Thr Leu Asp Ala
    2760                2765                2770

aat gct gac ata ggg aat gga acc acc tca gca aac gaa gca ggt          8442
Asn Ala Asp Ile Gly Asn Gly Thr Thr Ser Ala Asn Glu Ala Gly
    2775                2780                2785

atc gca gct tcc atc act gcc aaa gga gag tcc aaa tta gaa gtt          8487
Ile Ala Ala Ser Ile Thr Ala Lys Gly Glu Ser Lys Leu Glu Val
    2790                2795                2800

ctc aat ttt gat ttt caa gca aat gca caa ctc tca aac cct aag          8532
Leu Asn Phe Asp Phe Gln Ala Asn Ala Gln Leu Ser Asn Pro Lys
    2805                2810                2815

att aat ccg ctg gct ctg aag gag tca gtg aag ttc tcc agc aag          8577
Ile Asn Pro Leu Ala Leu Lys Glu Ser Val Lys Phe Ser Ser Lys
    2820                2825                2830

tac ctg aga acg gag cat ggg agt gaa atg ctg ttt ttt gga aat          8622
Tyr Leu Arg Thr Glu His Gly Ser Glu Met Leu Phe Phe Gly Asn
    2835                2840                2845

gct att gag gga aaa tca aac aca gtg gca agt tta cac aca gaa          8667
Ala Ile Glu Gly Lys Ser Asn Thr Val Ala Ser Leu His Thr Glu
    2850                2855                2860

aaa aat aca ctg gag ctt agt aat gga gtg att gtc aag ata aac          8712
Lys Asn Thr Leu Glu Leu Ser Asn Gly Val Ile Val Lys Ile Asn
    2865                2870                2875

aat cag ctt acc ctg gat agc aac act aaa tac ttc cac aaa ttg          8757
Asn Gln Leu Thr Leu Asp Ser Asn Thr Lys Tyr Phe His Lys Leu
    2880                2885                2890
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aac atc ccc aaa ctg gac ttc tct agt cag gct gac ctg cgc aac     8802
Asn Ile Pro Lys Leu Asp Phe Ser Ser Gln Ala Asp Leu Arg Asn
    2895             2900             2905

gag atc aag aca ctg ttg aaa gct ggc cac ata gca tgg act tct     8847
Glu Ile Lys Thr Leu Leu Lys Ala Gly His Ile Ala Trp Thr Ser
    2910             2915             2920

tct gga aaa ggg tca tgg aaa tgg gcc tgc ccc aga ttc tca gat     8892
Ser Gly Lys Gly Ser Trp Lys Trp Ala Cys Pro Arg Phe Ser Asp
    2925             2930             2935

gag gga aca cat gaa tca caa att agt ttc acc ata gaa gga ccc     8937
Glu Gly Thr His Glu Ser Gln Ile Ser Phe Thr Ile Glu Gly Pro
    2940             2945             2950

ctc act tcc ttt gga ctg tcc aat aag atc aat agc aaa cac cta     8982
Leu Thr Ser Phe Gly Leu Ser Asn Lys Ile Asn Ser Lys His Leu
    2955             2960             2965

aga gta aac caa aac ttg gtt tat gaa tct ggc tcc ctc aac ttt     9027
Arg Val Asn Gln Asn Leu Val Tyr Glu Ser Gly Ser Leu Asn Phe
    2970             2975             2980

tct aaa ctt gaa att caa tca caa gtc gat tcc cag cat gtg ggc     9072
Ser Lys Leu Glu Ile Gln Ser Gln Val Asp Ser Gln His Val Gly
    2985             2990             2995

cac agt gtt cta act gct aaa ggc atg gca ctg ttt gga gaa ggg     9117
His Ser Val Leu Thr Ala Lys Gly Met Ala Leu Phe Gly Glu Gly
    3000             3005             3010

aag gca gag ttt act ggg agg cat gat gct cat tta aat gga aag     9162
Lys Ala Glu Phe Thr Gly Arg His Asp Ala His Leu Asn Gly Lys
    3015             3020             3025

gtt att gga act ttg aaa aat tct ctt ttc ttt tca gcc cag cca     9207
Val Ile Gly Thr Leu Lys Asn Ser Leu Phe Phe Ser Ala Gln Pro
    3030             3035             3040

ttt gag atc acg gca tcc aca aac aat gaa ggg aat ttg aaa gtt     9252
Phe Glu Ile Thr Ala Ser Thr Asn Asn Glu Gly Asn Leu Lys Val
    3045             3050             3055

cgt ttt cca tta agg tta aca ggg aag ata gac ttc ctg aat aac     9297
Arg Phe Pro Leu Arg Leu Thr Gly Lys Ile Asp Phe Leu Asn Asn
    3060             3065             3070

tat gca ctg ttt ctg agt ccc agt gcc cag caa gca agt tgg caa     9342
Tyr Ala Leu Phe Leu Ser Pro Ser Ala Gln Gln Ala Ser Trp Gln
    3075             3080             3085

gta agt gct agg ttc aat cag tat aag tac aac caa aat ttc tct     9387
Val Ser Ala Arg Phe Asn Gln Tyr Lys Tyr Asn Gln Asn Phe Ser
    3090             3095             3100
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324

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gct gga  aac aac gag aac att  atg gag gcc cat gta  gga ata aat      9432
Ala Gly  Asn Asn Glu Asn Ile  Met Glu Ala His Val  Gly Ile Asn
    3105             3110              3115

gga gaa  gca aat ctg gat ttc  tta aac att cct tta  aca att cct      9477
Gly Glu  Ala Asn Leu Asp Phe  Leu Asn Ile Pro Leu  Thr Ile Pro
    3120             3125              3130

gaa atg  cgt cta cct tac aca  ata atc aca act cct  cca ctg aaa      9522
Glu Met  Arg Leu Pro Tyr Thr  Ile Ile Thr Thr Pro  Pro Leu Lys
    3135             3140              3145

gat ttc  tct cta tgg gaa aaa  aca ggc ttg aag gaa  ttc ttg aaa      9567
Asp Phe  Ser Leu Trp Glu Lys  Thr Gly Leu Lys Glu  Phe Leu Lys
    3150             3155              3160

acg aca  aag caa tca ttt gat  tta agt gta aaa gct  cag tat aag      9612
Thr Thr  Lys Gln Ser Phe Asp  Leu Ser Val Lys Ala  Gln Tyr Lys
    3165             3170              3175

aaa aac  aaa cac agg cat tcc  atc aca aat cct ttg  gct gtg ctt      9657
Lys Asn  Lys His Arg His Ser  Ile Thr Asn Pro Leu  Ala Val Leu
    3180             3185              3190

tgt gag  ttt atc agt cag agc  atc aaa tcc ttt gac  agg cat ttt      9702
Cys Glu  Phe Ile Ser Gln Ser  Ile Lys Ser Phe Asp  Arg His Phe
    3195             3200              3205

gaa aaa  aac aga aac aat gca  tta gat ttt gtc acc  aaa tcc tat      9747
Glu Lys  Asn Arg Asn Asn Ala  Leu Asp Phe Val Thr  Lys Ser Tyr
    3210             3215              3220

aat gaa  aca aaa att aag ttt  gat aag tac aaa gct  gaa aaa tct      9792
Asn Glu  Thr Lys Ile Lys Phe  Asp Lys Tyr Lys Ala  Glu Lys Ser
    3225             3230              3235

cac gac  gag ctc ccc agg acc  ttt caa att cct gga  tac act gtt      9837
His Asp  Glu Leu Pro Arg Thr  Phe Gln Ile Pro Gly  Tyr Thr Val
    3240             3245              3250

cca gtt  gtc aat gtt gaa gtg  tct cca ttc acc ata  gag atg tcg      9882
Pro Val  Val Asn Val Glu Val  Ser Pro Phe Thr Ile  Glu Met Ser
    3255             3260              3265

gca ttc  ggc tat gtg ttc cca  aaa gca gtc agc atg  cct agt ttc      9927
Ala Phe  Gly Tyr Val Phe Pro  Lys Ala Val Ser Met  Pro Ser Phe
    3270             3275              3280

tcc atc  cta ggt tct gac gtc  cgt gtg cct tca tac  aca tta atc      9972
Ser Ile  Leu Gly Ser Asp Val  Arg Val Pro Ser Tyr  Thr Leu Ile
    3285             3290              3295

ctg cca  tca tta gag ctg cca  gtc ctt cat gtc cct  aga aat ctc      10017
Leu Pro  Ser Leu Glu Leu Pro  Val Leu His Val Pro  Arg Asn Leu
    3300             3305              3310
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aag agc  aca cgg tct tca gtg  aag ctg cag ggc act  tcc aaa att      10692
Lys Ser  Thr Arg Ser Ser Val  Lys Leu Gln Gly Thr  Ser Lys Ile
    3525                3530                3535

gat gat  atc tgg aac ctt gaa  gta aaa gaa aat ttt  gct gga gaa      10737
Asp Asp  Ile Trp Asn Leu Glu  Val Lys Glu Asn Phe  Ala Gly Glu
    3540                3545                3550

gcc aca  ctc caa cgc ata tat  tcc ctc tgg gag cac  agt acg aaa      10782
Ala Thr  Leu Gln Arg Ile Tyr  Ser Leu Trp Glu His  Ser Thr Lys
    3555                3560                3565

aac cac  tta cag cta gag ggc  ctc ttt ttc acc aac  gga gaa cat      10827
Asn His  Leu Gln Leu Glu Gly  Leu Phe Phe Thr Asn  Gly Glu His
    3570                3575                3580

aca agc  aaa gcc acc ctg gaa  ctc tct cca tgg caa  atg tca gct      10872
Thr Ser  Lys Ala Thr Leu Glu  Leu Ser Pro Trp Gln  Met Ser Ala
    3585                3590                3595

ctt gtt  cag gtc cat gca agt  cag ccc agt tcc ttc  cat gat ttc      10917
Leu Val  Gln Val His Ala Ser  Gln Pro Ser Ser Phe  His Asp Phe
    3600                3605                3610

cct gac  ctt ggc cag gaa gtg  gcc ctg aat gct aac  act aag aac      10962
Pro Asp  Leu Gly Gln Glu Val  Ala Leu Asn Ala Asn  Thr Lys Asn
    3615                3620                3625

cag aag  atc aga tgg aaa aat  gaa gtc cgg att cat  tct ggg tct      11007
Gln Lys  Ile Arg Trp Lys Asn  Glu Val Arg Ile His  Ser Gly Ser
    3630                3635                3640

ttc cag  agc cag gtc gag ctt  tcc aat gac caa gaa  aag gca cac      11052
Phe Gln  Ser Gln Val Glu Leu  Ser Asn Asp Gln Glu  Lys Ala His
    3645                3650                3655

ctt gac  att gca gga tcc tta  gaa gga cac cta agg  ttc ctc aaa      11097
Leu Asp  Ile Ala Gly Ser Leu  Glu Gly His Leu Arg  Phe Leu Lys
    3660                3665                3670

aat atc  atc cta cca gtc tat  gac aag agc tta tgg  gat ttc cta      11142
Asn Ile  Ile Leu Pro Val Tyr  Asp Lys Ser Leu Trp  Asp Phe Leu
    3675                3680                3685

aag ctg  gat gta acc acc agc  att ggt agg aga cag  cat ctt cgt      11187
Lys Leu  Asp Val Thr Thr Ser  Ile Gly Arg Arg Gln  His Leu Arg
    3690                3695                3700

gtt tca  act gcc ttt gtg tac  acc aaa aac ccc aat  ggc tat tca      11232
Val Ser  Thr Ala Phe Val Tyr  Thr Lys Asn Pro Asn  Gly Tyr Ser
    3705                3710                3715

ttc tcc  atc cct gta aaa gtt  ttg gct gat aaa ttc  att att cct      11277
Phe Ser  Ile Pro Val Lys Val  Leu Ala Asp Lys Phe  Ile Ile Pro
    3720                3725                3730
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327

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ggg ctg  aaa cta aat gat cta  aat tca gtt ctt gtc  atg cct acg       11322
Gly Leu  Lys Leu Asn Asp Leu  Asn Ser Val Leu Val  Met Pro Thr
    3735              3740              3745

ttc cat  gtc cca ttt aca gat  ctt cag gtt cca tcg  tgc aaa ctt       11367
Phe His  Val Pro Phe Thr Asp  Leu Gln Val Pro Ser  Cys Lys Leu
    3750              3755              3760

gac ttc  aga gaa ata caa atc  tat aag aag ctg aga  act tca tca       11412
Asp Phe  Arg Glu Ile Gln Ile  Tyr Lys Lys Leu Arg  Thr Ser Ser
    3765              3770              3775

ttt gcc  ctc aac cta cca aca  ctc ccc gag gta aaa  ttc cct gaa       11457
Phe Ala  Leu Asn Leu Pro Thr  Leu Pro Glu Val Lys  Phe Pro Glu
    3780              3785              3790

gtt gat  gtg tta aca aaa tat  tct caa cca gaa gac  tcc ttg att       11502
Val Asp  Val Leu Thr Lys Tyr  Ser Gln Pro Glu Asp  Ser Leu Ile
    3795              3800              3805

ccc ttt  ttt gag ata acc gtg  cct gaa tct cag tta  act gtg tcc       11547
Pro Phe  Phe Glu Ile Thr Val  Pro Glu Ser Gln Leu  Thr Val Ser
    3810              3815              3820

cag ttc  acg ctt cca aaa agt  gtt tca gat ggc att  gct gct ttg       11592
Gln Phe  Thr Leu Pro Lys Ser  Val Ser Asp Gly Ile  Ala Ala Leu
    3825              3830              3835

gat cta  aat gca gta gcc aac  aag atc gca gac ttt  gag ttg ccc       11637
Asp Leu  Asn Ala Val Ala Asn  Lys Ile Ala Asp Phe  Glu Leu Pro
    3840              3845              3850

acc atc  atc gtg cct gag cag  acc att gag att ccc  tcc att aag       11682
Thr Ile  Ile Val Pro Glu Gln  Thr Ile Glu Ile Pro  Ser Ile Lys
    3855              3860              3865

ttc tct  gta cct gct gga att  gcc att cct tcc ttt  caa gca ctg       11727
Phe Ser  Val Pro Ala Gly Ile  Ala Ile Pro Ser Phe  Gln Ala Leu
    3870              3875              3880

act gca  cgc ttt gag gta gac  tct ccc gtg tat aat  gcc act tgg       11772
Thr Ala  Arg Phe Glu Val Asp  Ser Pro Val Tyr Asn  Ala Thr Trp
    3885              3890              3895

agt gcc  agt ttg aaa aac aaa  gca gat tat gtt gaa  aca gtc ctg       11817
Ser Ala  Ser Leu Lys Asn Lys  Ala Asp Tyr Val Glu  Thr Val Leu
    3900              3905              3910

gat tcc  aca tgc agc tca acc  gta cag ttc cta gaa  tat gaa ctt       11862
Asp Ser  Thr Cys Ser Ser Thr  Val Gln Phe Leu Glu  Tyr Glu Leu
    3915              3920              3925

aat gtt  ttg gga aca cac aaa  atc gaa gat ggt acg  tta gcc tct       11907
Asn Val  Leu Gly Thr His Lys  Ile Glu Asp Gly Thr  Leu Ala Ser
    3930              3935              3940
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328

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aag act  aaa gga aca ttt gca  cac cgt gac ttc agt  gca gaa tat     11952
Lys Thr  Lys Gly Thr Phe Ala  His Arg Asp Phe Ser  Ala Glu Tyr
    3945             3950           3955


gaa gaa  gat ggc aaa tat gaa  gga ctt cag gaa tgg  gaa gga aaa     11997
Glu Glu  Asp Gly Lys Tyr Glu  Gly Leu Gln Glu Trp  Glu Gly Lys
    3960             3965           3970


gcg cac  ctc aat atc aaa agc  cca gcg ttc acc gat  ctc cat ctg     12042
Ala His  Leu Asn Ile Lys Ser  Pro Ala Phe Thr Asp  Leu His Leu
    3975             3980           3985


cgc tac  cag aaa gac aag aaa  ggc atc tcc acc tca  gca gcc tcc     12087
Arg Tyr  Gln Lys Asp Lys Lys  Gly Ile Ser Thr Ser  Ala Ala Ser
    3990             3995           4000


cca gcc  gta ggc acc gtg ggc  atg gat atg gat gaa  gat gac gac     12132
Pro Ala  Val Gly Thr Val Gly  Met Asp Met Asp Glu  Asp Asp Asp
    4005             4010           4015


ttt tct  aaa tgg aac ttc tac  tac agc cct cag tcc  tct cca gat     12177
Phe Ser  Lys Trp Asn Phe Tyr  Tyr Ser Pro Gln Ser  Ser Pro Asp
    4020             4025           4030


aaa aaa  ctc acc ata ttc aaa  act gag ttg agg gtc  cgg gaa tct     12222
Lys Lys  Leu Thr Ile Phe Lys  Thr Glu Leu Arg Val  Arg Glu Ser
    4035             4040           4045


gat gag  gaa act cag atc aaa  gtt aat tgg gaa gaa  gag gca gct     12267
Asp Glu  Glu Thr Gln Ile Lys  Val Asn Trp Glu Glu  Glu Ala Ala
    4050             4055           4060


tct ggc  ttg cta acc tct ctg  aaa gac aac gtg ccc  aag gcc aca     12312
Ser Gly  Leu Leu Thr Ser Leu  Lys Asp Asn Val Pro  Lys Ala Thr
    4065             4070           4075


ggg gtc  ctt tat gat tat gtc  aac aag tac cac tgg  gaa cac aca     12357
Gly Val  Leu Tyr Asp Tyr Val  Asn Lys Tyr His Trp  Glu His Thr
    4080             4085           4090


ggg ctc  acc ctg aga gaa gtg  tct tca aag ctg aga  aga aat ctg     12402
Gly Leu  Thr Leu Arg Glu Val  Ser Ser Lys Leu Arg  Arg Asn Leu
    4095             4100           4105


cag gac  cat gct gag tgg gtt  tat caa ggg gcc att  agg gaa att     12447
Gln Asp  His Ala Glu Trp Val  Tyr Gln Gly Ala Ile  Arg Glu Ile
    4110             4115           4120


gat gat  atc gac gag agg ttc  cag aaa gga gcc agt  ggg acc act     12492
Asp Asp  Ile Asp Glu Arg Phe  Gln Lys Gly Ala Ser  Gly Thr Thr
    4125             4130           4135


ggg acc  tac caa gag tgg aag  gac aag gcc cag aat  ctg tac cag     12537
Gly Thr  Tyr Gln Glu Trp Lys  Asp Lys Ala Gln Asn  Leu Tyr Gln
    4140             4145           4150
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329

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gaa ctg  ttg act cag gaa ggc  caa gcc agt ttc cag  gga ctc aag     12582
Glu Leu  Leu Thr Gln Glu Gly  Gln Ala Ser Phe Gln  Gly Leu Lys
    4155             4160               4165

gat aac  gtg ttt gat ggc ttg  gta cga gtt act caa  gaa ttc cat     12627
Asp Asn  Val Phe Asp Gly Leu  Val Arg Val Thr Gln  Glu Phe His
    4170             4175               4180

atg aaa  gtc aag cat ctg att  gac tca ctc att gat  ttt ctg aac     12672
Met Lys  Val Lys His Leu Ile  Asp Ser Leu Ile Asp  Phe Leu Asn
    4185             4190               4195

ttc ccc  aga ttc cag ttt ccg  ggg aaa cct ggg ata  tac act agg     12717
Phe Pro  Arg Phe Gln Phe Pro  Gly Lys Pro Gly Ile  Tyr Thr Arg
    4200             4205               4210

gag gaa  ctt tgc act atg ttc  ata agg gag gta ggg  acg gta ctg     12762
Glu Glu  Leu Cys Thr Met Phe  Ile Arg Glu Val Gly  Thr Val Leu
    4215             4220               4225

tcc cag  gta tat tcg aaa gtc  cat aat ggt tca gaa  ata ctg ttt     12807
Ser Gln  Val Tyr Ser Lys Val  His Asn Gly Ser Glu  Ile Leu Phe
    4230             4235               4240

tcc tat  ttc caa gac cta gtg  att aca ctt cct ttc  gag tta agg     12852
Ser Tyr  Phe Gln Asp Leu Val  Ile Thr Leu Pro Phe  Glu Leu Arg
    4245             4250               4255

aaa cat  aaa cta ata gat gta  atc tcg atg tat agg  gaa ctg ttg     12897
Lys His  Lys Leu Ile Asp Val  Ile Ser Met Tyr Arg  Glu Leu Leu
    4260             4265               4270

aaa gat  tta tca aaa gaa gcc  caa gag gta ttt aaa  gcc att cag     12942
Lys Asp  Leu Ser Lys Glu Ala  Gln Glu Val Phe Lys  Ala Ile Gln
    4275             4280               4285

tct ctc  aag acc aca gag gtg  cta cgt aat ctt cag  gac ctt tta     12987
Ser Leu  Lys Thr Thr Glu Val  Leu Arg Asn Leu Gln  Asp Leu Leu
    4290             4295               4300

caa ttc  att ttc caa cta ata  gaa gat aac att aaa  cag ctg aaa     13032
Gln Phe  Ile Phe Gln Leu Ile  Glu Asp Asn Ile Lys  Gln Leu Lys
    4305             4310               4315

gag atg  aaa ttt act tat ctt  att aat tat atc caa  gat gag atc     13077
Glu Met  Lys Phe Thr Tyr Leu  Ile Asn Tyr Ile Gln  Asp Glu Ile
    4320             4325               4330

aac aca  atc ttc aat gat tat  atc cca tat gtt ttt  aaa ttg ttg     13122
Asn Thr  Ile Phe Asn Asp Tyr  Ile Pro Tyr Val Phe  Lys Leu Leu
    4335             4340               4345

aaa gaa  aac cta tgc ctt aat  ctt cat aag ttc aat  gaa ttt att     13167
Lys Glu  Asn Leu Cys Leu Asn  Leu His Lys Phe Asn  Glu Phe Ile
    4350             4355               4360
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330

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caa aac  gag ctt cag gaa gct  tct caa gag tta cag  cag atc cat     13212
Gln Asn  Glu Leu Gln Glu Ala  Ser Gln Glu Leu Gln  Gln Ile His
    4365             4370              4375

caa tac  att atg gcc ctt cgt  gaa gaa tat ttt gat  cca agt ata     13257
Gln Tyr  Ile Met Ala Leu Arg  Glu Glu Tyr Phe Asp  Pro Ser Ile
    4380             4385              4390

gtt ggc  tgg aca gtg aaa tat  tat gaa ctt gaa gaa  aag ata gtc     13302
Val Gly  Trp Thr Val Lys Tyr  Tyr Glu Leu Glu Glu  Lys Ile Val
    4395             4400              4405

agt ctg  atc aag aac ctg tta  gtt gct ctt aag gac  ttc cat tct     13347
Ser Leu  Ile Lys Asn Leu Leu  Val Ala Leu Lys Asp  Phe His Ser
    4410             4415              4420

gaa tat  att gtc agt gcc tct  aac ttt act tcc caa  ctc tca agt     13392
Glu Tyr  Ile Val Ser Ala Ser  Asn Phe Thr Ser Gln  Leu Ser Ser
    4425             4430              4435

caa gtt  gag caa ttt ctg cac  aga aat att cag gaa  tat ctt agc     13437
Gln Val  Glu Gln Phe Leu His  Arg Asn Ile Gln Glu  Tyr Leu Ser
    4440             4445              4450

atc ctt  acc gat cca gat gga  aaa ggg aaa gag aag  att gca gag     13482
Ile Leu  Thr Asp Pro Asp Gly  Lys Gly Lys Glu Lys  Ile Ala Glu
    4455             4460              4465

ctt tct  gcc act gct cag gaa  ata att aaa agc cag  gcc att gcg     13527
Leu Ser  Ala Thr Ala Gln Glu  Ile Ile Lys Ser Gln  Ala Ile Ala
    4470             4475              4480

acg aag  aaa ata att tct gat  tac cac cag cag ttt  aga tat aaa     13572
Thr Lys  Lys Ile Ile Ser Asp  Tyr His Gln Gln Phe  Arg Tyr Lys
    4485             4490              4495

ctg caa  gat ttt tca gac caa  ctc tct gat tac tat  gaa aaa ttt     13617
Leu Gln  Asp Phe Ser Asp Gln  Leu Ser Asp Tyr Tyr  Glu Lys Phe
    4500             4505              4510

att gct  gaa tcc aaa aga ttg  att gac ctg tcc att  caa aac tac     13662
Ile Ala  Glu Ser Lys Arg Leu  Ile Asp Leu Ser Ile  Gln Asn Tyr
    4515             4520              4525

cac aca  ttt ctg ata tac atc  acg gag tta ctg aaa  aag ctg caa     13707
His Thr  Phe Leu Ile Tyr Ile  Thr Glu Leu Leu Lys  Lys Leu Gln
    4530             4535              4540

tca acc  aca gtc atg aac ccc  tac atg aag ctt gct  cca gga gaa     13752
Ser Thr  Thr Val Met Asn Pro  Tyr Met Lys Leu Ala  Pro Gly Glu
    4545             4550              4555

ctt act  atc atc ctc taa tttttttaaaa gaaatcttca tttattcttc        13800
Leu Thr  Ile Ile Leu
    4560
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331

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ttttccaatt gaactttcac atagcacaga aaaaattcaa aatgcctata ttgatcaaac   13860

catacagtga gccagccttg cagtaggcag tagactataa gcagaagcac atatgaactg   13920

gacctgcacc aaagctggca ccagggctcg gaaggtctct gaactcagaa ggatggcatt   13980

ttttgcaagt taaagaaaat caggatctga gttattttgc taaacttggg ggaggaggaa   14040

caaataaatg gagtctttat tgtgtatcat                                    14070
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<210> 128
<211> 4563
<212> PRT
<213> Homo sapiens

<400> 128

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Met Asp Pro Pro Arg Pro Ala Leu Leu Ala Leu Leu Ala Leu Pro Ala
1               5                   10                  15


Leu Leu Leu Leu Leu Leu Ala Gly Ala Arg Ala Glu Glu Glu Met Leu
            20                  25                  30


Glu Asn Val Ser Leu Val Cys Pro Lys Asp Ala Thr Arg Phe Lys His
            35                  40                  45


Leu Arg Lys Tyr Thr Tyr Asn Tyr Glu Ala Glu Ser Ser Ser Gly Val
        50                  55                  60


Pro Gly Thr Ala Asp Ser Arg Ser Ala Thr Arg Ile Asn Cys Lys Val
65                  70                  75                  80


Glu Leu Glu Val Pro Gln Leu Cys Ser Phe Ile Leu Lys Thr Ser Gln
                85                  90                  95


Cys Ile Leu Lys Glu Val Tyr Gly Phe Asn Pro Glu Gly Lys Ala Leu
                100                 105                 110


Leu Lys Lys Thr Lys Asn Ser Glu Glu Phe Ala Ala Ala Met Ser Arg
            115                 120                 125


Tyr Glu Leu Lys Leu Ala Ile Pro Glu Gly Lys Gln Val Phe Leu Tyr
130                 135                 140
```

332

```
Pro Glu Lys Asp Glu Pro Thr Tyr Ile Leu Asn Ile Lys Arg Gly Ile
145             150         155             160

Ile Ser Ala Leu Leu Val Pro Pro Glu Thr Glu Glu Ala Lys Gln Val
            165         170             175

Leu Phe Leu Asp Thr Val Tyr Gly Asn Cys Ser Thr His Phe Thr Val
            180             185             190

Lys Thr Arg Lys Gly Asn Val Ala Thr Glu Ile Ser Thr Glu Arg Asp
            195             200             205

Leu Gly Gln Cys Asp Arg Phe Lys Pro Ile Arg Thr Gly Ile Ser Pro
    210             215             220

Leu Ala Leu Ile Lys Gly Met Thr Arg Pro Leu Ser Thr Leu Ile Ser
225             230             235             240

Ser Ser Gln Ser Cys Gln Tyr Thr Leu Asp Ala Lys Arg Lys His Val
            245             250             255

Ala Glu Ala Ile Cys Lys Glu Gln His Leu Phe Leu Pro Phe Ser Tyr
            260             265             270

Lys Asn Lys Tyr Gly Met Val Ala Gln Val Thr Gln Thr Leu Lys Leu
            275             280             285

Glu Asp Thr Pro Lys Ile Asn Ser Arg Phe Phe Gly Glu Gly Thr Lys
    290             295             300

Lys Met Gly Leu Ala Phe Glu Ser Thr Lys Ser Thr Ser Pro Pro Lys
305             310             315             320

Gln Ala Glu Ala Val Leu Lys Thr Val Gln Glu Leu Lys Lys Leu Thr
            325             330             335

Ile Ser Glu Gln Asn Ile Gln Arg Ala Asn Leu Phe Asn Lys Leu Val
            340             345             350

Thr Glu Leu Arg Gly Leu Ser Asp Glu Ala Val Thr Ser Leu Leu Pro
            355             360             365
```

333

Gln Leu Ile Glu Val Ser Ser Pro Ile Thr Leu Gln Ala Leu Val Gln
    370   375   380

Cys Gly Gln Pro Gln Cys Ser Thr His Ile Leu Gln Trp Leu Lys Arg
385   390   395   400

Val His Ala Asn Pro Leu Leu Ile Asp Val Val Thr Tyr Leu Val Ala
            405   410   415

Leu Ile Pro Glu Pro Ser Ala Gln Gln Leu Arg Glu Ile Phe Asn Met
            420   425   430

Ala Arg Asp Gln Arg Ser Arg Ala Thr Leu Tyr Ala Leu Ser His Ala
    435   440   445

Val Asn Asn Tyr His Lys Thr Asn Pro Thr Gly Thr Gln Glu Leu Leu
    450   455   460

Asp Ile Ala Asn Tyr Leu Met Glu Gln Ile Gln Asp Asp Cys Thr Gly
465   470   475   480

Asp Glu Asp Tyr Thr Tyr Leu Ile Leu Arg Val Ile Gly Asn Met Gly
            485   490   495

Gln Thr Met Glu Gln Leu Thr Pro Glu Leu Lys Ser Ser Ile Leu Lys
            500   505   510

Cys Val Gln Ser Thr Lys Pro Ser Leu Met Ile Gln Lys Ala Ala Ile
    515   520   525

Gln Ala Leu Arg Lys Met Glu Pro Lys Asp Lys Asp Gln Glu Val Leu
    530   535   540

Leu Gln Thr Phe Leu Asp Asp Ala Ser Pro Gly Asp Lys Arg Leu Ala
545   550   555   560

Ala Tyr Leu Met Leu Met Arg Ser Pro Ser Gln Ala Asp Ile Asn Lys
            565   570   575

Ile Val Gln Ile Leu Pro Trp Glu Gln Asn Glu Gln Val Lys Asn Phe
            580   585   590

Val Ala Ser His Ile Ala Asn Ile Leu Asn Ser Glu Glu Leu Asp Ile
         595   600   605

Gln Asp Leu Lys Lys Leu Val Lys Glu Val Leu Lys Glu Ser Gln Leu
         610   615   620

Pro Thr Val Met Asp Phe Arg Lys Phe Ser Arg Asn Tyr Gln Leu Tyr
625   630   635   640

Lys Ser Val Ser Ile Pro Ser Leu Asp Pro Ala Ser Ala Lys Ile Glu
                 645   650   655

Gly Asn Leu Ile Phe Asp Pro Asn Asn Tyr Leu Pro Lys Glu Ser Met
         660   665   670

Leu Lys Thr Thr Leu Thr Ala Phe Gly Phe Ala Ser Ala Asp Leu Ile
         675   680   685

Glu Ile Gly Leu Glu Gly Lys Gly Phe Glu Pro Thr Leu Glu Ala Leu
         690   695   700

Phe Gly Lys Gln Gly Phe Phe Pro Asp Ser Val Asn Lys Ala Leu Tyr
705   710   715   720

Trp Val Asn Gly Gln Val Pro Asp Gly Val Ser Lys Val Leu Val Asp
                 725   730   735

His Phe Gly Tyr Thr Lys Asp Asp Lys His Glu Gln Asp Met Val Asn
                 740   745   750

Gly Ile Met Leu Ser Val Glu Lys Leu Ile Lys Asp Leu Lys Ser Lys
         755   760   765

Glu Val Pro Glu Ala Arg Ala Tyr Leu Arg Ile Leu Gly Glu Glu Leu
         770   775   780

Gly Phe Ala Ser Leu His Asp Leu Gln Leu Leu Gly Lys Leu Leu Leu
785   790   795   800

Met Gly Ala Arg Thr Leu Gln Gly Ile Pro Gln Met Ile Gly Glu Val
                 805   810   815

335

Ile Arg Lys Gly Ser Lys Asn Asp Phe Phe Leu His Tyr Ile Phe Met
        820   825   830

Glu Asn Ala Phe Glu Leu Pro Thr Gly Ala Gly Leu Gln Leu Gln Ile
        835   840   845

Ser Ser Ser Gly Val Ile Ala Pro Gly Ala Lys Ala Gly Val Lys Leu
    850   855   860

Glu Val Ala Asn Met Gln Ala Glu Leu Val Ala Lys Pro Ser Val Ser
865   870   875   880

Val Glu Phe Val Thr Asn Met Gly Ile Ile Ile Pro Asp Phe Ala Arg
                885   890   895

Ser Gly Val Gln Met Asn Thr Asn Phe Phe His Glu Ser Gly Leu Glu
            900   905   910

Ala His Val Ala Leu Lys Pro Gly Lys Leu Lys Phe Ile Ile Pro Ser
        915   920   925

Pro Lys Arg Pro Val Lys Leu Leu Ser Gly Gly Asn Thr Leu His Leu
    930   935   940

Val Ser Thr Thr Lys Thr Glu Val Ile Pro Pro Leu Ile Glu Asn Arg
945   950   955   960

Gln Ser Trp Ser Val Cys Lys Gln Val Phe Pro Gly Leu Asn Tyr Cys
            965   970   975

Thr Ser Gly Ala Tyr Ser Asn Ala Ser Ser Thr Asp Ser Ala Ser Tyr
        980   985   990

Tyr Pro Leu Thr Gly Asp Thr Arg Leu Glu Leu Glu Leu Arg Pro Thr
    995   1000   1005

Gly Glu Ile Glu Gln Tyr Ser Val Ser Ala Thr Tyr Glu Leu Gln
    1010   1015   1020

Arg Glu Asp Arg Ala Leu Val Asp Thr Leu Lys Phe Val Thr Gln
    1025   1030   1035

336

```
Ala Glu  Gly Ala Lys Gln Thr  Glu Ala Thr Met Thr  Phe Lys Tyr
    1040            1045                1050

Asn Arg  Gln Ser Met Thr Leu  Ser Ser Glu Val Gln  Ile Pro Asp
    1055            1060                1065

Phe Asp  Val Asp Leu Gly Thr  Ile Leu Arg Val Asn  Asp Glu Ser
    1070            1075                1080

Thr Glu  Gly Lys Thr Ser Tyr  Arg Leu Thr Leu Asp  Ile Gln Asn
    1085            1090                1095

Lys Lys  Ile Thr Glu Val Ala  Leu Met Gly His Leu  Ser Cys Asp
    1100          ·  1105                1110

Thr Lys  Glu Glu Arg Lys Ile  Lys Gly Val Ile Ser  Ile Pro Arg
    1115            1120                1125

Leu Gln  Ala Glu Ala Arg Ser  Glu Ile Leu Ala His  Trp Ser Pro
    1130            1135                1140

Ala Lys  Leu Leu Leu Gln Met  Asp Ser Ser Ala Thr  Ala Tyr Gly
    1145            1150                1155

Ser Thr  Val Ser Lys Arg Val  Ala Trp His Tyr Asp  Glu Glu Lys
    1160            1165                1170

Ile Glu  Phe Glu Trp Asn Thr  Gly Thr Asn Val Asp  Thr Lys Lys
    1175            1180                1185

Met Thr  Ser Asn Phe Pro Val  Asp Leu Ser Asp Tyr  Pro Lys Ser
    1190            1195                1200
        ·

Leu His  Met Tyr Ala Asn Arg  Leu Leu Asp His Arg  Val Pro Gln
    1205            1210                1215

Thr Asp  Met Thr Phe Arg His  Val Gly Ser Lys Leu  Ile Val Ala
    1220            1225                1230

Met Ser  Ser Trp Leu Gln Lys  Ala Ser Gly Ser Leu  Pro Tyr Thr
    1235            1240                1245
```

337

```
Gln Thr  Leu Gln Asp His Leu  Asn Ser Leu Lys Glu  Phe Asn Leu
    1250              1255              1260

Gln Asn  Met Gly Leu Pro Asp  Phe His Ile Pro Glu  Asn Leu Phe
    1265              1270              1275

Leu Lys  Ser Asp Gly Arg Val  Lys Tyr Thr Leu Asn  Lys Asn Ser
    1280              1285              1290

Leu Lys  Ile Glu Ile Pro Leu  Pro Phe Gly Gly Lys  Ser Ser Arg
    1295              1300              1305

Asp Leu  Lys Met Leu Glu Thr  Val Arg Thr Pro Ala  Leu His Phe
    1310              1315              1320

Lys Ser  Val Gly Phe His Leu  Pro Ser Arg Glu Phe  Gln Val Pro
    1325              1330              1335

Thr Phe  Thr Ile Pro Lys Leu  Tyr Gln Leu Gln Val  Pro Leu Leu
    1340              1345              1350

Gly Val  Leu Asp Leu Ser Thr  Asn Val Tyr Ser Asn  Leu Tyr Asn
    1355              1360              1365

Trp Ser  Ala Ser Tyr Ser Gly  Gly Asn Thr Ser Thr  Asp His Phe
    1370              1375              1380

Ser Leu  Arg Ala Arg Tyr His  Met Lys Ala Asp Ser  Val Val Asp
    1385              1390              1395

Leu Leu  Ser Tyr Asn Val Gln  Gly Ser Gly Glu Thr  Thr Tyr Asp
    1400              1405              1410

His Lys  Asn Thr Phe Thr Leu  Ser Cys Asp Gly Ser  Leu Arg His
    1415              1420              1425

Lys Phe  Leu Asp Ser Asn Ile  Lys Phe Ser His Val  Glu Lys Leu
    1430              1435              1440

Gly Asn  Asn Pro Val Ser Lys  Gly Leu Leu Ile Phe  Asp Ala Ser
    1445              1450              1455
```

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Ser Ser Trp Gly Pro Gln Met Ser Ala Ser Val His Leu Asp Ser
    1460   1465   1470

Lys Lys Lys Gln His Leu Phe Val Lys Glu Val Lys Ile Asp Gly
    1475   1480   1485

Gln Phe Arg Val Ser Ser Phe Tyr Ala Lys Gly Thr Tyr Gly Leu
    1490   1495   1500

Ser Cys Gln Arg Asp Pro Asn Thr Gly Arg Leu Asn Gly Glu Ser
    1505   1510   1515

Asn Leu Arg Phe Asn Ser Ser Tyr Leu Gln Gly Thr Asn Gln Ile
    1520   1525   1530

Thr Gly Arg Tyr Glu Asp Gly Thr Leu Ser Leu Thr Ser Thr Ser
    1535   1540   1545

Asp Leu Gln Ser Gly Ile Ile Lys Asn Thr Ala Ser Leu Lys Tyr
    1550   1555   1560

Glu Asn Tyr Glu Leu Thr Leu Lys Ser Asp Thr Asn Gly Lys Tyr
    1565   1570   1575

Lys Asn Phe Ala Thr Ser Asn Lys Met Asp Met Thr Phe Ser Lys
    1580   1585   1590

Gln Asn Ala Leu Leu Arg Ser Glu Tyr Gln Ala Asp Tyr Glu Ser
    1595   1600   1605

Leu Arg Phe Phe Ser Leu Leu Ser Gly Ser Leu Asn Ser His Gly
    1610   1615   1620

Leu Glu Leu Asn Ala Asp Ile Leu Gly Thr Asp Lys Ile Asn Ser
    1625   1630   1635

Gly Ala His Lys Ala Thr Leu Arg Ile Gly Gln Asp Gly Ile Ser
    1640   1645   1650

Thr Ser Ala Thr Thr Asn Leu Lys Cys Ser Leu Leu Val Leu Glu
    1655   1660   1665

339

Asn Glu Leu Asn Ala Glu Leu Gly Leu Ser Gly Ala Ser Met Lys
    1670   1675   1680

Leu Thr Thr Asn Gly Arg Phe Arg Glu His Asn Ala Lys Phe Ser
    1685   1690   1695

Leu Asp Gly Lys Ala Ala Leu Thr Glu Leu Ser Leu Gly Ser Ala
    1700   1705   1710

Tyr Gln Ala Met Ile Leu Gly Val Asp Ser Lys Asn Ile Phe Asn
    1715   1720   1725

Phe Lys Val Ser Gln Glu Gly Leu Lys Leu Ser Asn Asp Met Met
    1730   1735   1740

Gly Ser Tyr Ala Glu Met Lys Phe Asp His Thr Asn Ser Leu Asn
    1745   1750   1755

Ile Ala Gly Leu Ser Leu Asp Phe Ser Ser Lys Leu Asp Asn Ile
    1760   1765   1770

Tyr Ser Ser Asp Lys Phe Tyr Lys Gln Thr Val Asn Leu Gln Leu
    1775   1780   1785

Gln Pro Tyr Ser Leu Val Thr Thr Leu Asn Ser Asp Leu Lys Tyr
    1790   1795   1800

Asn Ala Leu Asp Leu Thr Asn Asn Gly Lys Leu Arg Leu Glu Pro
    1805   1810   1815

Leu Lys Leu His Val Ala Gly Asn Leu Lys Gly Ala Tyr Gln Asn
    1820   1825   1830

Asn Glu Ile Lys His Ile Tyr Ala Ile Ser Ser Ala Ala Leu Ser
    1835   1840   1845

Ala Ser Tyr Lys Ala Asp Thr Val Ala Lys Val Gln Gly Val Glu
    1850   1855   1860

Phe Ser His Arg Leu Asn Thr Asp Ile Ala Gly Leu Ala Ser Ala
    1865   1870   1875

340

Ile Asp Met Ser Thr Asn Tyr Asn Ser Asp Ser Leu His Phe Ser
    1880   1885   1890

Asn Val Phe Arg Ser Val Met Ala Pro Phe Thr Met Thr Ile Asp
    1895   1900   1905

Ala His Thr Asn Gly Asn Gly Lys Leu Ala Leu Trp Gly Glu His
    1910   1915   1920

Thr Gly Gln Leu Tyr Ser Lys Phe Leu Leu Lys Ala Glu Pro Leu
    1925   1930   1935

Ala Phe Thr Phe Ser His Asp Tyr Lys Gly Ser Thr Ser His His
    1940   1945   1950

Leu Val Ser Arg Lys Ser Ile Ser Ala Ala Leu Glu His Lys Val
    1955   1960   1965

Ser Ala Leu Leu Thr Pro Ala Glu Gln Thr Gly Thr Trp Lys Leu
    1970   1975   1980

Lys Thr Gln Phe Asn Asn Asn Glu Tyr Ser Gln Asp Leu Asp Ala
    1985   1990   1995

Tyr Asn Thr Lys Asp Lys Ile Gly Val Glu Leu Thr Gly Arg Thr
    2000   2005   2010

Leu Ala Asp Leu Thr Leu Leu Asp Ser Pro Ile Lys Val Pro Leu
    2015   2020   2025

Leu Leu Ser Glu Pro Ile Asn Ile Ile Asp Ala Leu Glu Met Arg
    2030   2035   2040

Asp Ala Val Glu Lys Pro Gln Glu Phe Thr Ile Val Ala Phe Val
    2045   2050   2055

Lys Tyr Asp Lys Asn Gln Asp Val His Ser Ile Asn Leu Pro Phe
    2060   2065   2070

Phe Glu Thr Leu Gln Glu Tyr Phe Glu Arg Asn Arg Gln Thr Ile
    2075   2080   2085

341

```
Ile Val  Val Leu Glu Asn Val  Gln Arg Asn Leu Lys  His Ile Asn
    2090                 2095                 2100

Ile Asp  Gln Phe Val Arg Lys  Tyr Arg Ala Ala Leu  Gly Lys Leu
    2105                 2110                 2115

Pro Gln  Gln Ala Asn Asp Tyr  Leu Asn Ser Phe Asn  Trp Glu Arg
    2120                 2125                 2130

Gln Val  Ser His Ala Lys Glu  Lys Leu Thr Ala Leu  Thr Lys Lys
    2135                 2140                 2145

Tyr Arg  Ile Thr Glu Asn Asp  Ile Gln Ile Ala Leu  Asp Asp Ala
    2150                 2155                 2160

Lys Ile  Asn Phe Asn Glu Lys  Leu Ser Gln Leu Gln  Thr Tyr Met
    2165                 2170                 2175

Ile Gln  Phe Asp Gln Tyr Ile  Lys Asp Ser Tyr Asp  Leu His Asp
    2180                 2185                 2190

Leu Lys  Ile Ala Ile Ala Asn  Ile Ile Asp Glu Ile  Ile Glu Lys
    2195                 2200                 2205

Leu Lys  Ser Leu Asp Glu His  Tyr His Ile Arg Val  Asn Leu Val
    2210                 2215                 2220

Lys Thr  Ile His Asp Leu His  Leu Phe Ile Glu Asn  Ile Asp Phe
    2225                 2230                 2235

Asn Lys  Ser Gly Ser Ser Thr  Ala Ser Trp Ile Gln  Asn Val Asp
    2240                 2245                 2250

Thr Lys  Tyr Gln Ile Arg Ile  Gln Ile Gln Glu Lys  Leu Gln Gln
    2255                 2260                 2265

Leu Lys  Arg His Ile Gln Asn  Ile Asp Ile Gln His  Leu Ala Gly
    2270                 2275                 2280

Lys Leu  Lys Gln His Ile Glu  Ala Ile Asp Val Arg  Val Leu Leu
    2285                 2290                 2295
```

342

```
Asp Gln  Leu Gly Thr Thr Ile  Ser Phe Glu Arg Ile  Asn Asp Val
    2300             2305             2310

Leu Glu  His Val Lys His Phe  Val Ile Asn Leu Ile  Gly Asp Phe
    2315             2320             2325

Glu Val  Ala Glu Lys Ile Asn  Ala Phe Arg Ala Lys  Val His Glu
    2330             2335             2340

Leu Ile  Glu Arg Tyr Glu Val  Asp Gln Gln Ile Gln  Val Leu Met
    2345             2350             2355

Asp Lys  Leu Val Glu Leu Ala  His Gln Tyr Lys Leu  Lys Glu Thr
    2360             2365             2370

Ile Gln  Lys Leu Ser Asn Val  Leu Gln Gln Val Lys  Ile Lys Asp
    2375             2380             2385

Tyr Phe  Glu Lys Leu Val Gly  Phe Ile Asp Asp Ala  Val Lys Lys
    2390             2395             2400

Leu Asn  Glu Leu Ser Phe Lys  Thr Phe Ile Glu Asp  Val Asn Lys
    2405             2410             2415

Phe Leu  Asp Met Leu Ile Lys  Lys Leu Lys Ser Phe  Asp Tyr His
    2420             2425             2430

Gln Phe  Val Asp Glu Thr Asn  Asp Lys Ile Arg Glu  Val Thr Gln
    2435             2440             2445

Arg Leu  Asn Gly Glu Ile Gln  Ala Leu Glu Leu Pro  Gln Lys Ala
    2450             2455             2460

Glu Ala  Leu Lys Leu Phe Leu  Glu Glu Thr Lys Ala  Thr Val Ala
    2465             2470             2475

Val Tyr  Leu Glu Ser Leu Gln  Asp Thr Lys Ile Thr  Leu Ile Ile
    2480             2485             2490

Asn Trp  Leu Gln Glu Ala Leu  Ser Ser Ala Ser Leu  Ala His Met
    2495             2500             2505
```

343

Lys Ala Lys Phe Arg Glu Thr Leu Glu Asp Thr Arg Asp Arg Met
    2510   2515   2520

Tyr Gln Met Asp Ile Gln Gln Glu Leu Gln Arg Tyr Leu Ser Leu
    2525   2530   2535

Val Gly Gln Val Tyr Ser Thr Leu Val Thr Tyr Ile Ser Asp Trp
    2540   2545   2550

Trp Thr Leu Ala Ala Lys Asn Leu Thr Asp Phe Ala Glu Gln Tyr
    2555   2560   2565

Ser Ile Gln Asp Trp Ala Lys Arg Met Lys Ala Leu Val Glu Gln
    2570   2575   2580

Gly Phe Thr Val Pro Glu Ile Lys Thr Ile Leu Gly Thr Met Pro
    2585   2590   2595

Ala Phe Glu Val Ser Leu Gln Ala Leu Gln Lys Ala Thr Phe Gln
    2600   2605   2610

Thr Pro Asp Phe Ile Val Pro Leu Thr Asp Leu Arg Ile Pro Ser
    2615   2620   2625

Val Gln Ile Asn Phe Lys Asp Leu Lys Asn Ile Lys Ile Pro Ser
    2630   2635   2640

Arg Phe Ser Thr Pro Glu Phe Thr Ile Leu Asn Thr Phe His Ile
    2645   2650   2655

Pro Ser Phe Thr Ile Asp Phe Val Glu Met Lys Val Lys Ile Ile
    2660   2665   2670

Arg Thr Ile Asp Gln Met Leu Asn Ser Glu Leu Gln Trp Pro Val
    2675   2680   2685

Pro Asp Ile Tyr Leu Arg Asp Leu Lys Val Glu Asp Ile Pro Leu
    2690   2695   2700

Ala Arg Ile Thr Leu Pro Asp Phe Arg Leu Pro Glu Ile Ala Ile
    2705   2710   2715

344

```
Pro Glu  Phe Ile Ile Pro Thr  Leu Asn Leu Asn Asp  Phe Gln Val
    2720              2725              2730


Pro Asp  Leu His Ile Pro Glu  Phe Gln Leu Pro His  Ile Ser His
    2735              2740              2745


Thr Ile  Glu Val Pro Thr Phe  Gly Lys Leu Tyr Ser  Ile Leu Lys
    2750              2755              2760


Ile Gln  Ser Pro Leu Phe Thr  Leu Asp Ala Asn Ala  Asp Ile Gly
    2765              2770              2775


Asn Gly  Thr Thr Ser Ala Asn  Glu Ala Gly Ile Ala  Ala Ser Ile
    2780              2785              2790


Thr Ala  Lys Gly Glu Ser Lys  Leu Glu Val Leu Asn  Phe Asp Phe
    2795              2800              2805


Gln Ala  Asn Ala Gln Leu Ser  Asn Pro Lys Ile Asn  Pro Leu Ala
    2810              2815              2820


Leu Lys  Glu Ser Val Lys Phe  Ser Ser Lys Tyr Leu  Arg Thr Glu
    2825              2830              2835


His Gly  Ser Glu Met Leu Phe  Phe Gly Asn Ala Ile  Glu Gly Lys
    2840              2845              2850


Ser Asn  Thr Val Ala Ser Leu  His Thr Glu Lys Asn  Thr Leu Glu
    2855              2860              2865


Leu Ser  Asn Gly Val Ile Val  Lys Ile Asn Asn Gln  Leu Thr Leu
    2870              2875              2880


Asp Ser  Asn Thr Lys Tyr Phe  His Lys Leu Asn Ile  Pro Lys Leu
    2885              2890              2895


Asp Phe  Ser Ser Gln Ala Asp  Leu Arg Asn Glu Ile  Lys Thr Leu
    2900              2905              2910


Leu Lys  Ala Gly His Ile Ala  Trp Thr Ser Ser Gly  Lys Gly Ser
    2915              2920              2925
```

345

```
Trp Lys Trp Ala Cys Pro Arg Phe Ser Asp Glu Gly Thr His Glu
    2930            2935            2940

Ser Gln Ile Ser Phe Thr Ile Glu Gly Pro Leu Thr Ser Phe Gly
    2945            2950            2955

Leu Ser Asn Lys Ile Asn Ser Lys His Leu Arg Val Asn Gln Asn
    2960            2965            2970

Leu Val Tyr Glu Ser Gly Ser Leu Asn Phe Ser Lys Leu Glu Ile
    2975            2980            2985

Gln Ser Gln Val Asp Ser Gln His Val Gly His Ser Val Leu Thr
    2990            2995            3000

Ala Lys Gly Met Ala Leu Phe Gly Glu Gly Lys Ala Glu Phe Thr
    3005            3010            3015

Gly Arg His Asp Ala His Leu Asn Gly Lys Val Ile Gly Thr Leu
    3020            3025            3030

Lys Asn Ser Leu Phe Phe Ser Ala Gln Pro Phe Glu Ile Thr Ala
    3035            3040            3045

Ser Thr Asn Asn Glu Gly Asn Leu Lys Val Arg Phe Pro Leu Arg
    3050            3055            3060

Leu Thr Gly Lys Ile Asp Phe Leu Asn Asn Tyr Ala Leu Phe Leu
    3065            3070            3075

Ser Pro Ser Ala Gln Gln Ala Ser Trp Gln Val Ser Ala Arg Phe
    3080            3085            3090

Asn Gln Tyr Lys Tyr Asn Gln Asn Phe Ser Ala Gly Asn Asn Glu
    3095            3100            3105

Asn Ile Met Glu Ala His Val Gly Ile Asn Gly Glu Ala Asn Leu
    3110            3115            3120

Asp Phe Leu Asn Ile Pro Leu Thr Ile Pro Glu Met Arg Leu Pro
    3125            3130            3135
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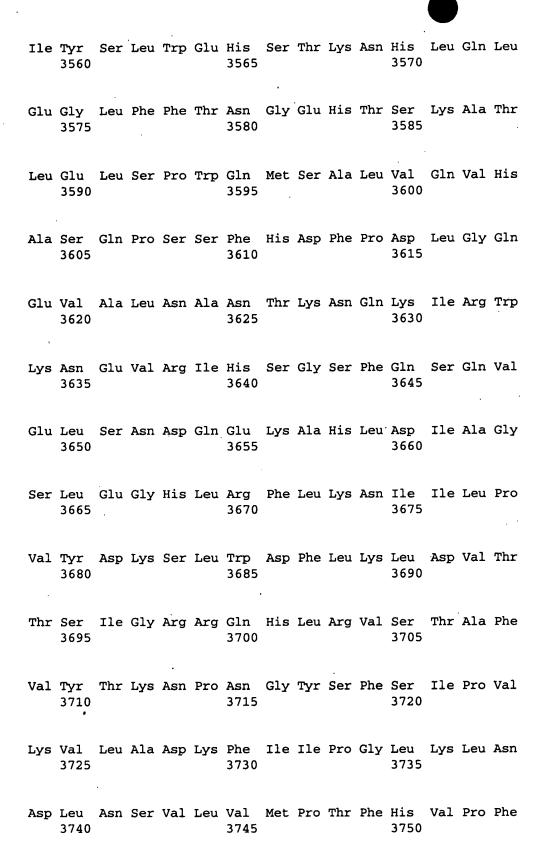
346

```
Tyr Thr Ile Ile Thr Thr Pro  Pro Leu Lys Asp Phe  Ser Leu Trp
    3140            3145              3150
```

```
Glu Lys Thr Gly Leu Lys Glu  Phe Leu Lys Thr Thr  Lys Gln Ser
    3155            3160              3165
```

```
Phe Asp Leu Ser Val Lys Ala  Gln Tyr Lys Lys Asn  Lys His Arg
    3170            3175              3180
```

```
His Ser Ile Thr Asn Pro Leu  Ala Val Leu Cys Glu  Phe Ile Ser
    3185            3190              3195
```

```
Gln Ser Ile Lys Ser Phe Asp  Arg His Phe Glu Lys  Asn Arg Asn
    3200            3205              3210
```

```
Asn Ala Leu Asp Phe Val Thr  Lys Ser Tyr Asn Glu  Thr Lys Ile
    3215            3220              3225
```

```
Lys Phe Asp Lys Tyr Lys Ala  Glu Lys Ser His Asp  Glu Leu Pro
    3230            3235              3240
```

```
Arg Thr Phe Gln Ile Pro Gly  Tyr Thr Val Pro Val  Val Asn Val
    3245            3250              3255
```

```
Glu Val Ser Pro Phe Thr Ile  Glu Met Ser Ala Phe  Gly Tyr Val
    3260            3265              3270
```

```
Phe Pro Lys Ala Val Ser Met  Pro Ser Phe Ser Ile  Leu Gly Ser
    3275            3280              3285
```

```
Asp Val Arg Val Pro Ser Tyr  Thr Leu Ile Leu Pro  Ser Leu Glu
    3290            3295              3300
```

```
Leu Pro Val Leu His Val Pro  Arg Asn Leu Lys Leu  Ser Leu Pro
    3305            3310              3315
```

```
Asp Phe Lys Glu Leu Cys Thr  Ile Ser His Ile Phe  Ile Pro Ala
    3320            3325              3330
```

```
Met Gly Asn Ile Thr Tyr Asp  Phe Ser Phe Lys Ser  Ser Val Ile
    3335            3340              3345
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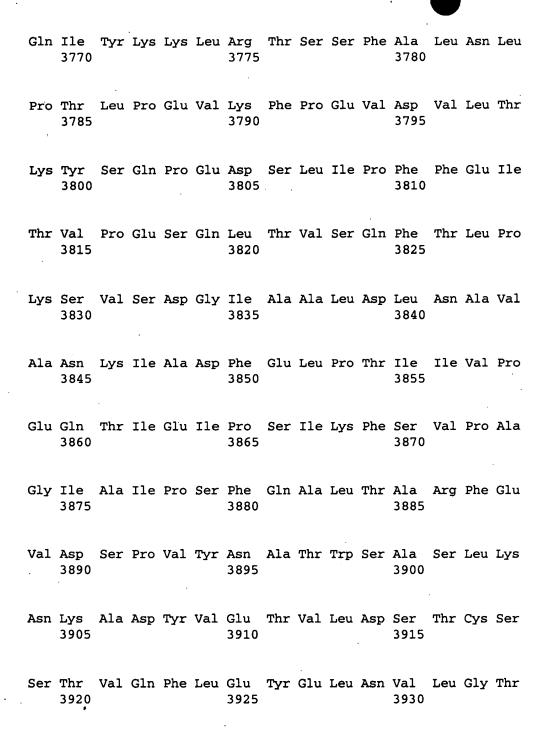
347

Thr Leu Asn Thr Asn Ala Glu Leu Phe Asn Gln Ser Asp Ile Val
    3350   3355   3360

Ala His Leu Leu Ser Ser Ser Ser Ser Val Ile Asp Ala Leu Gln
    3365   3370   3375

Tyr Lys Leu Glu Gly Thr Thr Arg Leu Thr Arg Lys Arg Gly Leu
    3380   3385   3390

Lys Leu Ala Thr Ala Leu Ser Leu Ser Asn Lys Phe Val Glu Gly
    3395   3400   3405

Ser His Asn Ser Thr Val Ser Leu Thr Thr Lys Asn Met Glu Val
    3410   3415   3420

Ser Val Ala Thr Thr Thr Lys Ala Gln Ile Pro Ile Leu Arg Met
    3425   3430   3435

Asn Phe Lys Gln Glu Leu Asn Gly Asn Thr Lys Ser Lys Pro Thr
    3440   3445   3450

Val Ser Ser Ser Met Glu Phe Lys Tyr Asp Phe Asn Ser Ser Met
    3455   3460   3465

Leu Tyr Ser Thr Ala Lys Gly Ala Val Asp His Lys Leu Ser Leu
    3470   3475   3480

Glu Ser Leu Thr Ser Tyr Phe Ser Ile Glu Ser Ser Thr Lys Gly
    3485   3490   3495

Asp Val Lys Gly Ser Val Leu Ser Arg Glu Tyr Ser Gly Thr Ile
    3500   3505   3510

Ala Ser Glu Ala Asn Thr Tyr Leu Asn Ser Lys Ser Thr Arg Ser
    3515   3520   3525

Ser Val Lys Leu Gln Gly Thr Ser Lys Ile Asp Asp Ile Trp Asn
    3530   3535   3540

Leu Glu Val Lys Glu Asn Phe Ala Gly Glu Ala Thr Leu Gln Arg
    3545   3550   3555

348

Ile Tyr Ser Leu Trp Glu His Ser Thr Lys Asn His Leu Gln Leu
    3560   3565   3570

Glu Gly Leu Phe Phe Thr Asn Gly Glu His Thr Ser Lys Ala Thr
    3575   3580   3585

Leu Glu Leu Ser Pro Trp Gln Met Ser Ala Leu Val Gln Val His
    3590   3595   3600

Ala Ser Gln Pro Ser Ser Phe His Asp Phe Pro Asp Leu Gly Gln
    3605   3610   3615

Glu Val Ala Leu Asn Ala Asn Thr Lys Asn Gln Lys Ile Arg Trp
    3620   3625   3630

Lys Asn Glu Val Arg Ile His Ser Gly Ser Phe Gln Ser Gln Val
    3635   3640   3645

Glu Leu Ser Asn Asp Gln Glu Lys Ala His Leu Asp Ile Ala Gly
    3650   3655   3660

Ser Leu Glu Gly His Leu Arg Phe Leu Lys Asn Ile Ile Leu Pro
    3665   3670   3675

Val Tyr Asp Lys Ser Leu Trp Asp Phe Leu Lys Leu Asp Val Thr
    3680   3685   3690

Thr Ser Ile Gly Arg Arg Gln His Leu Arg Val Ser Thr Ala Phe
    3695   3700   3705

Val Tyr Thr Lys Asn Pro Asn Gly Tyr Ser Phe Ser Ile Pro Val
    3710   3715   3720

Lys Val Leu Ala Asp Lys Phe Ile Ile Pro Gly Leu Lys Leu Asn
    3725   3730   3735

Asp Leu Asn Ser Val Leu Val Met Pro Thr Phe His Val Pro Phe
    3740   3745   3750

Thr Asp Leu Gln Val Pro Ser Cys Lys Leu Asp Phe Arg Glu Ile
    3755   3760   3765

```
Gln Ile  Tyr Lys Lys Leu Arg  Thr Ser Ser Phe Ala  Leu Asn Leu
    3770            3775            3780
```

```
Pro Thr  Leu Pro Glu Val Lys  Phe Pro Glu Val Asp  Val Leu Thr
    3785            3790            3795
```

```
Lys Tyr  Ser Gln Pro Glu Asp  Ser Leu Ile Pro Phe  Phe Glu Ile
    3800            3805            3810
```

```
Thr Val  Pro Glu Ser Gln Leu  Thr Val Ser Gln Phe  Thr Leu Pro
    3815            3820            3825
```

```
Lys Ser  Val Ser Asp Gly Ile  Ala Ala Leu Asp Leu  Asn Ala Val
    3830            3835            3840
```

```
Ala Asn  Lys Ile Ala Asp Phe  Glu Leu Pro Thr Ile  Ile Val Pro
    3845            3850            3855
```

```
Glu Gln  Thr Ile Glu Ile Pro  Ser Ile Lys Phe Ser  Val Pro Ala
    3860            3865            3870
```

```
Gly Ile  Ala Ile Pro Ser Phe  Gln Ala Leu Thr Ala  Arg Phe Glu
    3875            3880            3885
```

```
Val Asp  Ser Pro Val Tyr Asn  Ala Thr Trp Ser Ala  Ser Leu Lys
    3890            3895            3900
```

```
Asn Lys  Ala Asp Tyr Val Glu  Thr Val Leu Asp Ser  Thr Cys Ser
    3905            3910            3915
```

```
Ser Thr  Val Gln Phe Leu Glu  Tyr Glu Leu Asn Val  Leu Gly Thr
    3920            3925            3930
```

```
His Lys  Ile Glu Asp Gly Thr  Leu Ala Ser Lys Thr  Lys Gly Thr
    3935            3940            3945
```

```
Phe Ala  His Arg Asp Phe Ser  Ala Glu Tyr Glu Glu  Asp Gly Lys
    3950            3955            3960
```

```
Tyr Glu  Gly Leu Gln Glu Trp  Glu Gly Lys Ala His  Leu Asn Ile
    3965            3970            3975
```

350

```
Lys Ser  Pro Ala Phe Thr Asp  Leu His Leu Arg Tyr  Gln Lys Asp
    3980              3985              3990

Lys Lys  Gly Ile Ser Thr Ser  Ala Ala Ser Pro Ala  Val Gly Thr
    3995              4000              4005

Val Gly  Met Asp Met Asp Glu  Asp Asp Asp Phe Ser  Lys Trp Asn
    4010              4015              4020

Phe Tyr  Tyr Ser Pro Gln Ser  Ser Pro Asp Lys Lys  Leu Thr Ile
    4025              4030              4035

Phe Lys  Thr Glu Leu Arg Val  Arg Glu Ser Asp Glu  Glu Thr Gln
    4040              4045              4050

Ile Lys  Val Asn Trp Glu Glu  Glu Ala Ala Ser Gly  Leu Leu Thr
    4055              4060              4065

Ser Leu  Lys Asp Asn Val Pro  Lys Ala Thr Gly Val  Leu Tyr Asp
    4070              4075              4080

Tyr Val  Asn Lys Tyr His Trp  Glu His Thr Gly Leu  Thr Leu Arg
    4085              4090              4095

Glu Val  Ser Ser Lys Leu Arg  Arg Asn Leu Gln Asp  His Ala Glu
    4100              4105              4110

Trp Val  Tyr Gln Gly Ala Ile  Arg Glu Ile Asp Asp  Ile Asp Glu
    4115              4120              4125

Arg Phe  Gln Lys Gly Ala Ser  Gly Thr Thr Gly Thr  Tyr Gln Glu
    4130              4135              4140

Trp Lys  Asp Lys Ala Gln Asn  Leu Tyr Gln Glu Leu  Leu Thr Gln
    4145              4150              4155

Glu Gly  Gln Ala Ser Phe Gln  Gly Leu Lys Asp Asn  Val Phe Asp
    4160              4165              4170

Gly Leu  Val Arg Val Thr Gln  Glu Phe His Met Lys  Val Lys His
    4175              4180              4185
```

351

Leu Ile Asp Ser Leu Ile Asp Phe Leu Asn Phe Pro Arg Phe Gln
    4190   4195   4200

Phe Pro Gly Lys Pro Gly Ile Tyr Thr Arg Glu Glu Leu Cys Thr
    4205   4210   4215

Met Phe Ile Arg Glu Val Gly Thr Val Leu Ser Gln Val Tyr Ser
    4220   4225   4230

Lys Val His Asn Gly Ser Glu Ile Leu Phe Ser Tyr Phe Gln Asp
    4235   4240   4245

Leu Val Ile Thr Leu Pro Phe Glu Leu Arg Lys His Lys Leu Ile
    4250   4255   4260

Asp Val Ile Ser Met Tyr Arg Glu Leu Leu Lys Asp Leu Ser Lys
    4265   4270   4275

Glu Ala Gln Glu Val Phe Lys Ala Ile Gln Ser Leu Lys Thr Thr
    4280   4285   4290

Glu Val Leu Arg Asn Leu Gln Asp Leu Leu Gln Phe Ile Phe Gln
    4295   4300   4305

Leu Ile Glu Asp Asn Ile Lys Gln Leu Lys Glu Met Lys Phe Thr
    4310   4315   4320

Tyr Leu Ile Asn Tyr Ile Gln Asp Glu Ile Asn Thr Ile Phe Asn
    4325   4330   4335

Asp Tyr Ile Pro Tyr Val Phe Lys Leu Leu Lys Glu Asn Leu Cys
    4340   4345   4350

Leu Asn Leu His Lys Phe Asn Glu Phe Ile Gln Asn Glu Leu Gln
    4355   4360   4365

Glu Ala Ser Gln Glu Leu Gln Gln Ile His Gln Tyr Ile Met Ala
    4370   4375   4380

Leu Arg Glu Glu Tyr Phe Asp Pro Ser Ile Val Gly Trp Thr Val
    4385   4390   4395

352

```
Lys Tyr  Tyr Glu Leu Glu Glu  Lys Ile Val Ser Leu  Ile Lys Asn
    4400              4405              4410

Leu Leu  Val Ala Leu Lys Asp  Phe His Ser Glu Tyr  Ile Val Ser
    4415              4420              4425

Ala Ser  Asn Phe Thr Ser Gln  Leu Ser Ser Gln Val  Glu Gln Phe
    4430              4435              4440

Leu His  Arg Asn Ile Gln Glu  Tyr Leu Ser Ile Leu  Thr Asp Pro
    4445              4450              4455

Asp Gly  Lys Gly Lys Glu Lys  Ile Ala Glu Leu Ser  Ala Thr Ala
    4460              4465              4470

Gln Glu  Ile Ile Lys Ser Gln  Ala Ile Ala Thr Lys  Lys Ile Ile
    4475              4480              4485

Ser Asp  Tyr His Gln Gln Phe  Arg Tyr Lys Leu Gln  Asp Phe Ser
    4490              4495              4500

Asp Gln  Leu Ser Asp Tyr Tyr  Glu Lys Phe Ile Ala  Glu Ser Lys
    4505              4510              4515

Arg Leu  Ile Asp Leu Ser Ile  Gln Asn Tyr His Thr  Phe Leu Ile
    4520              4525              4530

Tyr Ile  Thr Glu Leu Leu Lys  Lys Leu Gln Ser Thr  Thr Val Met
    4535              4540              4545

Asn Pro  Tyr Met Lys Leu Ala  Pro Gly Glu Leu Thr  Ile Ile Leu
    4550              4555              4560
```

<210> 129
<211> 1156
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (61)..(1014)
<223>

353

<400> 129

cgcagcggag gtgaaggacg tccttcccca ggagccgact ggccaatcac aggcaggaag   60

atg	aag	gtt	ctg	tgg	gct	gcg	ttg	ctg	gtc	aca	ttc	ctg	gca	gga	tgc	108
Met	Lys	Val	Leu	Trp	Ala	Ala	Leu	Leu	Val	Thr	Phe	Leu	Ala	Gly	Cys	
1				5					10					15		

cag	gcc	aag	gtg	gag	caa	gcg	gtg	gag	aca	gag	ccg	gag	ccc	gag	ctg	156
Gln	Ala	Lys	Val	Glu	Gln	Ala	Val	Glu	Thr	Glu	Pro	Glu	Pro	Glu	Leu	
			20					25					30			

cgc	cag	cag	acc	gag	tgg	cag	agc	ggc	cag	cgc	tgg	gaa	ctg	gca	ctg	204
Arg	Gln	Gln	Thr	Glu	Trp	Gln	Ser	Gly	Gln	Arg	Trp	Glu	Leu	Ala	Leu	
		35					40					45				

ggt	cgc	ttt	tgg	gat	tac	ctg	cgc	tgg	gtg	cag	aca	ctg	tct	gag	cag	252
Gly	Arg	Phe	Trp	Asp	Tyr	Leu	Arg	Trp	Val	Gln	Thr	Leu	Ser	Glu	Gln	
	50					55					60					

gtg	cag	gag	gag	ctg	ctc	agc	tcc	cag	gtc	acc	cag	gaa	ctg	agg	gcg	300
Val	Gln	Glu	Glu	Leu	Leu	Ser	Ser	Gln	Val	Thr	Gln	Glu	Leu	Arg	Ala	
65					70					75					80	

ctg	atg	gac	gag	acc	atg	aag	gag	ttg	aag	gcc	tac	aaa	tcg	gaa	ctg	348
Leu	Met	Asp	Glu	Thr	Met	Lys	Glu	Leu	Lys	Ala	Tyr	Lys	Ser	Glu	Leu	
				85					90					95		

gag	gaa	caa	ctg	acc	ccg	gtg	gcg	gag	gag	acg	cgg	gca	cgg	ctg	tcc	396
Glu	Glu	Gln	Leu	Thr	Pro	Val	Ala	Glu	Glu	Thr	Arg	Ala	Arg	Leu	Ser	
			100					105					110			

aag	gag	ctg	cag	gcg	gcg	cag	gcc	cgg	ctg	ggc	gcg	gac	atg	gag	gac	444
Lys	Glu	Leu	Gln	Ala	Ala	Gln	Ala	Arg	Leu	Gly	Ala	Asp	Met	Glu	Asp	
		115					120					125				

gtg	tgc	ggc	cgc	ctg	gtg	cag	tac	cgc	ggc	gag	gtg	cag	gcc	atg	ctc	492
Val	Cys	Gly	Arg	Leu	Val	Gln	Tyr	Arg	Gly	Glu	Val	Gln	Ala	Met	Leu	
	130					135					140					

ggc	cag	agc	acc	gag	gag	ctg	cgg	gtg	cgc	ctc	gcc	tcc	cac	ctg	cgc	540
Gly	Gln	Ser	Thr	Glu	Glu	Leu	Arg	Val	Arg	Leu	Ala	Ser	His	Leu	Arg	
145					150					155					160	

aag	ctg	cgt	aag	cgg	ctc	ctc	cgc	gat	gcc	gat	gac	ctg	cag	aag	cgc	588
Lys	Leu	Arg	Lys	Arg	Leu	Leu	Arg	Asp	Ala	Asp	Asp	Leu	Gln	Lys	Arg	
			165					170					175			

ctg	gca	gtg	tac	cag	gcc	ggg	gcc	cgc	gag	ggc	gcc	gag	cgc	ggc	ctc	636
Leu	Ala	Val	Tyr	Gln	Ala	Gly	Ala	Arg	Glu	Gly	Ala	Glu	Arg	Gly	Leu	
			180					185					190			

agc	gcc	atc	cgc	gag	cgc	ctg	ggg	ccc	ctg	gtg	gaa	cag	ggc	cgc	gtg	684
Ser	Ala	Ile	Arg	Glu	Arg	Leu	Gly	Pro	Leu	Val	Glu	Gln	Gly	Arg	Val	
		195					200					205				

354

```
cgg gcc gcc act gtg ggc tcc ctg gcc ggc cag ccg cta cag gag cgg    732
Arg Ala Ala Thr Val Gly Ser Leu Ala Gly Gln Pro Leu Gln Glu Arg
    210             215             220

gcc cag gcc tgg ggc gag cgg ctg cgc gcg cgg atg gag gag atg ggc    780
Ala Gln Ala Trp Gly Glu Arg Leu Arg Ala Arg Met Glu Glu Met Gly
225             230             235             240

agc cgg acc cgc gac cgc ctg gac gag gtg aag gag cag gtg gcg gag    828
Ser Arg Thr Arg Asp Arg Leu Asp Glu Val Lys Glu Gln Val Ala Glu
            245             250             255

gtg cgc gcc aag ctg gag gag cag gcc cag cag ata cgc ctg cag gcc    876
Val Arg Ala Lys Leu Glu Glu Gln Ala Gln Gln Ile Arg Leu Gln Ala
            260             265             270

gag gcc ttc cag gcc cgc ctc aag agc tgg ttc gag ccc ctg gtg gaa    924
Glu Ala Phe Gln Ala Arg Leu Lys Ser Trp Phe Glu Pro Leu Val Glu
            275             280             285

gac atg cag cgc cag tgg gcc ggg ctg gtg gag aag gtg cag gct gcc    972
Asp Met Gln Arg Gln Trp Ala Gly Leu Val Glu Lys Val Gln Ala Ala
    290             295             300

gtg ggc acc agc gcc gcc cct gtg ccc agc gac aat cac tga           1014
Val Gly Thr Ser Ala Ala Pro Val Pro Ser Asp Asn His
305             310             315

acgccgaagc ctgcagccat gcgaccccac gccacccgt gcctcctgcc tccgcgcagc   1074

ctgcagcggg agaccctgtc cccgccccag ccgtcctcct ggggtggacc ctagtttaat   1134

aaagattcac caagtttcac gc                                          1156
```

<210> 130
<211> 317
<212> PRT
<213> Homo sapiens

<400> 130

```
Met Lys Val Leu Trp Ala Ala Leu Leu Val Thr Phe Leu Ala Gly Cys
1               5                   10              15


Gln Ala Lys Val Glu Gln Ala Val Glu Thr Glu Pro Glu Pro Glu Leu
            20              25              30



Arg Gln Gln Thr Glu Trp Gln Ser Gly Gln Arg Trp Glu Leu Ala Leu
        35              40              45
```

355

```
Gly Arg Phe Trp Asp Tyr Leu Arg Trp Val Gln Thr Leu Ser Glu Gln
    50              55              60

Val Gln Glu Glu Leu Leu Ser Ser Gln Val Thr Gln Glu Leu Arg Ala
65              70              75              80

Leu Met Asp Glu Thr Met Lys Glu Leu Lys Ala Tyr Lys Ser Glu Leu
                85              90              95

Glu Glu Gln Leu Thr Pro Val Ala Glu Glu Thr Arg Ala Arg Leu Ser
            100             105             110

Lys Glu Leu Gln Ala Ala Gln Ala Arg Leu Gly Ala Asp Met Glu Asp
        115             120             125

Val Cys Gly Arg Leu Val Gln Tyr Arg Gly Glu Val Gln Ala Met Leu
    130             135             140

Gly Gln Ser Thr Glu Glu Leu Arg Val Arg Leu Ala Ser His Leu Arg
145             150             155             160

Lys Leu Arg Lys Arg Leu Leu Arg Asp Ala Asp Asp Leu Gln Lys Arg
            165             170             175

Leu Ala Val Tyr Gln Ala Gly Ala Arg Glu Gly Ala Glu Arg Gly Leu
            180             185             190

Ser Ala Ile Arg Glu Arg Leu Gly Pro Leu Val Glu Gln Gly Arg Val
        195             200             205

Arg Ala Ala Thr Val Gly Ser Leu Ala Gly Gln Pro Leu Gln Glu Arg
    210             215             220

Ala Gln Ala Trp Gly Glu Arg Leu Arg Ala Arg Met Glu Glu Met Gly
225             230             235             240

Ser Arg Thr Arg Asp Arg Leu Asp Glu Val Lys Glu Gln Val Ala Glu
            245             250             255

Val Arg Ala Lys Leu Glu Glu Gln Ala Gln Gln Ile Arg Leu Gln Ala
        260             265             270
```

356

```
Glu Ala Phe Gln Ala Arg Leu Lys Ser Trp Phe Glu Pro Leu Val Glu
    275                 280             285


Asp Met Gln Arg Gln Trp Ala Gly Leu Val Glu Lys Val Gln Ala Ala
    290                 295             300


Val Gly Thr Ser Ala Ala Pro Val Pro Ser Asp Asn His
305                 310             315
```

<210> 131
<211> 542
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (3)..(542)
<223>

<400> 131

```
ct ctg ggc gac gtt gct ggc aga gga aat gag aag aag ccc agt agc    47
   Leu Gly Asp Val Ala Gly Arg Gly Asn Glu Lys Lys Pro Ser Ser
    1               5               10              15

gtg agg gct ctg tcc att gtc ctc ccc atc gcc acg gag ctg ggt ctc    95
Val Arg Ala Leu Ser Ile Val Leu Pro Ile Ala Thr Glu Leu Gly Leu
                20              25              30

tgg tct cgg ggg cag ctg tgt gac aga gcg tgc ctc tcc cta cgg tgc    143
Trp Ser Arg Gly Gln Leu Cys Asp Arg Ala Cys Leu Ser Leu Arg Cys
            35              40              45

tcc tcg tct tcc ttt gcc tgg ggg tct tcc ttc tat gga aga act ggc    191
Ser Ser Ser Ser Phe Ala Trp Gly Ser Ser Phe Tyr Gly Arg Thr Gly
        50              55              60

ggc tta aga aca tca aca gca tca act ttg aca acc ccg tct atc aga    239
Gly Leu Arg Thr Ser Thr Ala Ser Thr Leu Thr Thr Pro Ser Ile Arg
    65              70              75

aga cca cag agg atg agg tcc aca ttt gcc aca acc agg acg gct aca    287
Arg Pro Gln Arg Met Arg Ser Thr Phe Ala Thr Thr Arg Thr Ala Thr
80              85              90              95

gct acc cct cga gac aga tgg tca gtc tgg agg atg acg tgg cgt gaa    335
Ala Thr Pro Arg Asp Arg Trp Ser Val Trp Arg Met Thr Trp Arg Glu
                100             105             110

cat ctg cct gga gtc ccg ccc ctg ccc aga acc ctt cct gag acc tcg    383
His Leu Pro Gly Val Pro Pro Leu Pro Arg Thr Leu Pro Glu Thr Ser
            115             120           - 125
```

```
ccg gcc ttg ttt tat tca aag aca gag aag acc aaa gca ttg cct gcc      431
Pro Ala Leu Phe Tyr Ser Lys Thr Glu Lys Thr Lys Ala Leu Pro Ala
        130             135             140

aga gct ttg ttt tat ata ttt att cat ctg gga ggc aga aca ggc ttc      479
Arg Ala Leu Phe Tyr Ile Phe Ile His Leu Gly Gly Arg Thr Gly Phe
        145             150             155

gga cag tgc cca tgc aat ggc ttg ggt tgg gat ttt ggt ttc ttc ctt      527
Gly Gln Cys Pro Cys Asn Gly Leu Gly Trp Asp Phe Gly Phe Phe Leu
160             165             170             175

tcc tgt gaa gga taa                                                   542
Ser Cys Glu Gly
```

<210> 132
<211> 179
<212> PRT
<213> Homo sapiens

<400> 132

```
Leu Gly Asp Val Ala Gly Arg Gly Asn Glu Lys Lys Pro Ser Ser Val
1               5               10              15


Arg Ala Leu Ser Ile Val Leu Pro Ile Ala Thr Glu Leu Gly Leu Trp
            20              25              30


Ser Arg Gly Gln Leu Cys Asp Arg Ala Cys Leu Ser Leu Arg Cys Ser
            35              40              45


Ser Ser Ser Phe Ala Trp Gly Ser Ser Phe Tyr Gly Arg Thr Gly Gly
    50              55              60


Leu Arg Thr Ser Thr Ala Ser Thr Leu Thr Thr Pro Ser Ile Arg Arg
65              70              75              80


Pro Gln Arg Met Arg Ser Thr Phe Ala Thr Thr Arg Thr Ala Thr Ala
                85              90              95


Thr Pro Arg Asp Arg Trp Ser Val Trp Arg Met Thr Trp Arg Glu His
            100             105             110


Leu Pro Gly Val Pro Pro Leu Pro Arg Thr Leu Pro Glu Thr Ser Pro
        115             120             125
```

Ala Leu Phe Tyr Ser Lys Thr Glu Lys Thr Lys Ala Leu Pro Ala Arg
    130   135   140

Ala Leu Phe Tyr Ile Phe Ile His Leu Gly Gly Arg Thr Gly Phe Gly
145   150   155   160

Gln Cys Pro Cys Asn Gly Leu Gly Trp Asp Phe Gly Phe Phe Leu Ser
                165   170   175

Cys Glu Gly

<210> 133
<211> 3408
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (27)..(2519)
<223>

<400> 133
cgagcgctcc caccgagctg cctgcc atg ggg ctg ggg ctg ctg ctc ccg ctg   53
                              Met Gly Leu Gly Leu Leu Leu Pro Leu
                              1   5

ctg ctg ctc tgg act cgg ggg act cag ggg tcc gag ctg gac ccc aaa   101
Leu Leu Leu Trp Thr Arg Gly Thr Gln Gly Ser Glu Leu Asp Pro Lys
10   15   20   25

ggg cag cac gtc tgt gtg gcc agc agc ccc tct gct gag ctg cag tgc   149
Gly Gln His Val Cys Val Ala Ser Ser Pro Ser Ala Glu Leu Gln Cys
                30   35   40

tgc gca ggc tgg agg cag aag gat caa gaa tgc acc atc ccc atc tgt   197
Cys Ala Gly Trp Arg Gln Lys Asp Gln Glu Cys Thr Ile Pro Ile Cys
                45   50   55

gag ggg ccg gac gcc tgc cag aaa gac gag gtg tgt gtg aag ccg ggc   245
Glu Gly Pro Asp Ala Cys Gln Lys Asp Glu Val Cys Val Lys Pro Gly
        60   65   70

ctc tgt cga tgc aag cct gga ttc ttt ggg gcc cac tgc agc tcc cgc   293
Leu Cys Arg Cys Lys Pro Gly Phe Phe Gly Ala His Cys Ser Ser Arg
        75   80   85

tgc ccg ggc cag tac tgg ggc ccc gac tgc cgt gag agc tgc ccc tgc   341
Cys Pro Gly Gln Tyr Trp Gly Pro Asp Cys Arg Glu Ser Cys Pro Cys
90   95   100   105

359

```
cac ccg cac ggc cag tgc gag cca gcc acg ggc gcg tgc cag tgc cag      389
His Pro His Gly Gln Cys Glu Pro Ala Thr Gly Ala Cys Gln Cys Gln
                110               115               120

gcc gac cgc tgg gga gcc cgc tgc gag ttc ccg tgc gcc tgc ggc ccc      437
Ala Asp Arg Trp Gly Ala Arg Cys Glu Phe Pro Cys Ala Cys Gly Pro
                125               130               135

cac ggg cgc tgc gac ccc gcg acc ggc gtg tgc cac tgc gaa ccc ggc      485
His Gly Arg Cys Asp Pro Ala Thr Gly Val Cys His Cys Glu Pro Gly
                140               145               150

tgg tgg tcg tcc acg tgc cgc cgc ccg tgc cag tgc aac acc gcg gcg      533
Trp Trp Ser Ser Thr Cys Arg Arg Pro Cys Gln Cys Asn Thr Ala Ala
        155               160               165

gcg cgc tgc gag cag gcc acg ggc gcc tgc gtg tgc aag ccg ggc tgg      581
Ala Arg Cys Glu Gln Ala Thr Gly Ala Cys Val Cys Lys Pro Gly Trp
170               175               180               185

tgg ggg cgc cgc tgc agc ttc cgc tgc aac tgc cac ggc tcc ccg tgc      629
Trp Gly Arg Arg Cys Ser Phe Arg Cys Asn Cys His Gly Ser Pro Cys
                190               195               200

gag cag gac tcc ggc cgc tgc gcc tgc cgg ccg ggc tgg tgg ggt ccc      677
Glu Gln Asp Ser Gly Arg Cys Ala Cys Arg Pro Gly Trp Trp Gly Pro
                205               210               215

gaa tgc cag cag cag tgc gag tgt gtg cgg ggc cgc tgc agc gcc gcc      725
Glu Cys Gln Gln Gln Cys Glu Cys Val Arg Gly Arg Cys Ser Ala Ala
                220               225               230

tcc ggc gag tgc acc tgc ccg ccc ggc ttc cgc gga gcg cgc tgc gag      773
Ser Gly Glu Cys Thr Cys Pro Pro Gly Phe Arg Gly Ala Arg Cys Glu
                235               240               245

ctg ccc tgc ccg gca ggc agc cac ggg gtg cag tgc gca cac agc tgt      821
Leu Pro Cys Pro Ala Gly Ser His Gly Val Gln Cys Ala His Ser Cys
250               255               260               265

ggc cgc tgc aaa cac aat gag ccg tgc tct cca gac aca ggc agc tgt      869
Gly Arg Cys Lys His Asn Glu Pro Cys Ser Pro Asp Thr Gly Ser Cys
                270               275               280

gag tcc tgc gag ccg ggc tgg aac ggg acc cag tgc cag cag ccc tgc      917
Glu Ser Cys Glu Pro Gly Trp Asn Gly Thr Gln Cys Gln Gln Pro Cys
                285               290               295

ctg cct ggc acc ttt ggc gag agc tgc gaa cag cag tgc cct cac tgc      965
Leu Pro Gly Thr Phe Gly Glu Ser Cys Glu Gln Gln Cys Pro His Cys
                300               305               310

cga cat ggg gag gcc tgt gag cca gat act ggc cac tgt cag cgc tgt     1013
Arg His Gly Glu Ala Cys Glu Pro Asp Thr Gly His Cys Gln Arg Cys
                315               320               325
```

360

```
gac cct ggc tgg ctg ggg ccc agg tgt gaa gac ccc tgc ccc act ggt        1061
Asp Pro Gly Trp Leu Gly Pro Arg Cys Glu Asp Pro Cys Pro Thr Gly
330                 335                 340                 345

acc ttt ggg gaa gac tgt ggc tct acc tgc ccc acc tgt gtt cag ggg        1109
Thr Phe Gly Glu Asp Cys Gly Ser Thr Cys Pro Thr Cys Val Gln Gly
                    350                 355                 360

tcc tgt gat act gtg aca ggg gac tgt gtc tgc agt gcc ggc tac tgg        1157
Ser Cys Asp Thr Val Thr Gly Asp Cys Val Cys Ser Ala Gly Tyr Trp
                365                 370                 375

ggg ccc agc tgc aac gcc tcc tgc cca gcc ggt ttc cat gga aac aac        1205
Gly Pro Ser Cys Asn Ala Ser Cys Pro Ala Gly Phe His Gly Asn Asn
                380                 385                 390

tgc tca gtt cct tgt gaa tgc cca gag gga ctc tgc cac cct gtc tct        1253
Cys Ser Val Pro Cys Glu Cys Pro Glu Gly Leu Cys His Pro Val Ser
                395                 400                 405

ggg tcc tgc cag cca ggc tct ggc agt cgg gac act gcc ctc atc gtg        1301
Gly Ser Cys Gln Pro Gly Ser Gly Ser Arg Asp Thr Ala Leu Ile Val
410                 415                 420                 425

ggc agc ctt gtg cct ctg ctg ctg ctc ttc ctg ggt ctt gcc tgc tgt        1349
Gly Ser Leu Val Pro Leu Leu Leu Leu Phe Leu Gly Leu Ala Cys Cys
                430                 435                 440

gcc tgc tgc tgc tgg gcc ccc cga tca gac ctc aag gac agg cca gcg        1397
Ala Cys Cys Cys Trp Ala Pro Arg Ser Asp Leu Lys Asp Arg Pro Ala
                445                 450                 455

aga gat gga gct acc gtg tcc agg atg aag ctg cag gtc tgg ggg aca        1445
Arg Asp Gly Ala Thr Val Ser Arg Met Lys Leu Gln Val Trp Gly Thr
                460                 465                 470

ctg acc agc ttg ggc tcc acg ctg ccc tgc cgt tcc ctc agc tcc cac        1493
Leu Thr Ser Leu Gly Ser Thr Leu Pro Cys Arg Ser Leu Ser Ser His
475                 480                 485

aag cta ccc tgg gtg aca gtc tca cat cac gac ccg gag gtc ccc ttc        1541
Lys Leu Pro Trp Val Thr Val Ser His His Asp Pro Glu Val Pro Phe
490                 495                 500                 505

aac cac agc ttc atc gag ccg ccc tct gcc ggc tgg gcc act gat gac        1589
Asn His Ser Phe Ile Glu Pro Pro Ser Ala Gly Trp Ala Thr Asp Asp
                510                 515                 520

tcc ttc tca tcc gat cct gag tct gga gag gca gat gag gtt cct gcc        1637
Ser Phe Ser Ser Asp Pro Glu Ser Gly Glu Ala Asp Glu Val Pro Ala
                525                 530                 535

tac tgt gtg cca ccc caa gaa ggg atg gtc cct gtg gcc cag gca ggg        1685
Tyr Cys Val Pro Pro Gln Glu Gly Met Val Pro Val Ala Gln Ala Gly
                540                 545                 550
```

361

```
tcg tca gag gcc agc ctg gct gca ggt gct ttc ccg ccc cct gag gac    1733
Ser Ser Glu Ala Ser Leu Ala Ala Gly Ala Phe Pro Pro Pro Glu Asp
    555             560             565

gcc tcc acg cca ttc gcc atc ccg cgc acc tcc agc cta gct cgg gcc    1781
Ala Ser Thr Pro Phe Ala Ile Pro Arg Thr Ser Ser Leu Ala Arg Ala
570             575             580             585

aag cgg cca tcg gtc tcc ttc gcg gaa ggt acc aag ttt gca cca cag    1829
Lys Arg Pro Ser Val Ser Phe Ala Glu Gly Thr Lys Phe Ala Pro Gln
            590             595             600

agt cgc cga agc tca ggg gag ctc tcc agc ccg ctc cga aag ccc aag    1877
Ser Arg Arg Ser Ser Gly Glu Leu Ser Ser Pro Leu Arg Lys Pro Lys
            605             610             615

agg ctc tcc cgg ggg gcg cag tcg ggt cct gag ggc cgg gaa gcc gaa    1925
Arg Leu Ser Arg Gly Ala Gln Ser Gly Pro Glu Gly Arg Glu Ala Glu
            620             625             630

gag tcc aca ggc cca gac gaa gca gaa gcc ccc gag tcc ttt ccg gcg    1973
Glu Ser Thr Gly Pro Asp Glu Ala Glu Ala Pro Glu Ser Phe Pro Ala
    635             640             645

gct gcc agt ccc ggg gat tca gcc act ggc cac cgg cgg ccc cca ctt    2021
Ala Ala Ser Pro Gly Asp Ser Ala Thr Gly His Arg Arg Pro Pro Leu
650             655             660             665

ggt agc cgg aca gtg gct gag cac gtg gaa gcc att gag ggc agc gtc    2069
Gly Ser Arg Thr Val Ala Glu His Val Glu Ala Ile Glu Gly Ser Val
            670             675             680

cag gag agc tcg ggc cct gtg acc acg atc tac atg ctg gca ggg aag    2117
Gln Glu Ser Ser Gly Pro Val Thr Thr Ile Tyr Met Leu Ala Gly Lys
            685             690             695

ccc cgc gga tcc gaa ggc cct gtc cgc tct gtc ttc cgc cat ttt ggt    2165
Pro Arg Gly Ser Glu Gly Pro Val Arg Ser Val Phe Arg His Phe Gly
            700             705             710

agc ttc cag aaa ggc cag gcg gaa gcc aag gtc aag agg gcc atc cct    2213
Ser Phe Gln Lys Gly Gln Ala Glu Ala Lys Val Lys Arg Ala Ile Pro
    715             720             725

aag cct ccg cgc cag gcc ctg aat cgg aaa aag ggc agc cct ggc ctt    2261
Lys Pro Pro Arg Gln Ala Leu Asn Arg Lys Lys Gly Ser Pro Gly Leu
730             735             740             745

gcc tct ggc tct gtc ggc cag agc ccc aac tca gcc cca aaa gct ggg    2309
Ala Ser Gly Ser Val Gly Gln Ser Pro Asn Ser Ala Pro Lys Ala Gly
            750             755             760

ctt cct ggg gcc aca ggg cct atg gca gtc aga cca gag gaa gcg gtc    2357
Leu Pro Gly Ala Thr Gly Pro Met Ala Val Arg Pro Glu Glu Ala Val
            765             770             775
```

362

```
cgg ggg ctg ggg gct ggc acc gag agt tca agg aga gcc cag gag cca       2405
Arg Gly Leu Gly Ala Gly Thr Glu Ser Ser Arg Arg Ala Gln Glu Pro
        780                 785                 790

gtc tct ggc tgt ggc tcc cca gaa cag gat ccc cag aag cag gct gaa       2453
Val Ser Gly Cys Gly Ser Pro Glu Gln Asp Pro Gln Lys Gln Ala Glu
        795                 800                 805

gag gaa agg cag gag gaa cct gag tat gag aat gtt gta ccc atc tcc       2501
Glu Glu Arg Gln Glu Glu Pro Glu Tyr Glu Asn Val Val Pro Ile Ser
810                 815                 820                 825

agg cca cca gaa ccc tga tgaccttgaa tttggggagt ggggagagtg             2549
Arg Pro Pro Glu Pro
                830
```

```
gatggactag actgtgctgt gtgctggaaa atgatcccgg ggccaggaca gacaaaccag     2609

agcctctgcg cctccacagg gaaaaggcaa ggcttccagg ccagttggcc caggcccctg     2669

gcagtgctcc cggagggggcc caggaaggcc tgggcagaga ccctgtagga tggggtcagg     2729

aagggttgcc tgcagggact tttgctctgc tgtcctggac cctgtgtgcc tcataagggc     2789

tattctttct ttcacgtgca aaacattttt ctgaaatagc aaacaaccta catgtttgct     2849

gataaaagat tggctaaaca aaatttttt tttttttgag acagaatctc cctctgtccc     2909

ccaggctgga gtgcagtggt gcgatctcgg ctcactgcaa gctctgcctc ccgggttcac     2969

gcccttctcc tgcctcagcc tcccgagtag ctgggactac aggtgccctc caccacgctt     3029

ggctaatttt tttgtatatt taatagagac agggtttcac catgttagcc aggatggtct     3089

cgatctcctg acctcgtgat ccacctgcct cggcctcccc aaagtgctgg gatgacaggc     3149

atgagccacc acgcctggtc tatgaacttt ttaaaaagga tgtatgtgta taaacagatt     3209

caagggaaag gcactaaatg gttttttcct ctggaagatg agattgtagg tgatatttat     3269

tttcttctga aactttttgta tagtttgcaa attttctaca gtgaacattc tttttttactt   3329

ttgttactag attgaatttg ataaagtata ataaaaagca atgatctttg ttaaaaaata     3389

aaaagtacta acattacag                                                 3408
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<210> 134
<211> 830
<212> PRT
<213> Homo sapiens

<400> 134

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Met Gly Leu Gly Leu Leu Leu Pro Leu Leu Leu Leu Trp Thr Arg Gly
1               5               10              15

Thr Gln Gly Ser Glu Leu Asp Pro Lys Gly Gln His Val Cys Val Ala
        20              25              30

Ser Ser Pro Ser Ala Glu Leu Gln Cys Cys Ala Gly Trp Arg Gln Lys
        35              40              45

Asp Gln Glu Cys Thr Ile Pro Ile Cys Glu Gly Pro Asp Ala Cys Gln
    50              55              60

Lys Asp Glu Val Cys Val Lys Pro Gly Leu Cys Arg Cys Lys Pro Gly
65              70              75              80

Phe Phe Gly Ala His Cys Ser Ser Arg Cys Pro Gly Gln Tyr Trp Gly
                85              90              95

Pro Asp Cys Arg Glu Ser Cys Pro Cys His Pro His Gly Gln Cys Glu
        100             105             110

Pro Ala Thr Gly Ala Cys Gln Cys Gln Ala Asp Arg Trp Gly Ala Arg
    115             120             125

Cys Glu Phe Pro Cys Ala Cys Gly Pro His Gly Arg Cys Asp Pro Ala
    130             135             140

Thr Gly Val Cys His Cys Glu Pro Gly Trp Trp Ser Ser Thr Cys Arg
145             150             155             160

Arg Pro Cys Gln Cys Asn Thr Ala Ala Ala Arg Cys Glu Gln Ala Thr
                165             170             175

Gly Ala Cys Val Cys Lys Pro Gly Trp Trp Gly Arg Arg Cys Ser Phe
            180             185             190

Arg Cys Asn Cys His Gly Ser Pro Cys Glu Gln Asp Ser Gly Arg Cys
        195             200             205
```

364

Ala Cys Arg Pro Gly Trp Trp Gly Pro Glu Cys Gln Gln Gln Cys Glu
    210   215   220

Cys Val Arg Gly Arg Cys Ser Ala Ala Ser Gly Glu Cys Thr Cys Pro
225   230   235   240

Pro Gly Phe Arg Gly Ala Arg Cys Glu Leu Pro Cys Pro Ala Gly Ser
            245   250   255

His Gly Val Gln Cys Ala His Ser Cys Gly Arg Cys Lys His Asn Glu
            260   265   270

Pro Cys Ser Pro Asp Thr Gly Ser Cys Glu Ser Cys Glu Pro Gly Trp
    275   280   285

Asn Gly Thr Gln Cys Gln Gln Pro Cys Leu Pro Gly Thr Phe Gly Glu
    290   295   300

Ser Cys Glu Gln Gln Cys Pro His Cys Arg His Gly Glu Ala Cys Glu
305   310   315   320

Pro Asp Thr Gly His Cys Gln Arg Cys Asp Pro Gly Trp Leu Gly Pro
            325   330   335

Arg Cys Glu Asp Pro Cys Pro Thr Gly Thr Phe Gly Glu Asp Cys Gly
            340   345   350

Ser Thr Cys Pro Thr Cys Val Gln Gly Ser Cys Asp Thr Val Thr Gly
        355   360   365

Asp Cys Val Cys Ser Ala Gly Tyr Trp Gly Pro Ser Cys Asn Ala Ser
    370   375   380

Cys Pro Ala Gly Phe His Gly Asn Asn Cys Ser Val Pro Cys Glu Cys
385   390   395   400

Pro Glu Gly Leu Cys His Pro Val Ser Gly Ser Cys Gln Pro Gly Ser
            405   410   415

Gly Ser Arg Asp Thr Ala Leu Ile Val Gly Ser Leu Val Pro Leu Leu
            420   425   430

365

Leu Leu Phe Leu Gly Leu Ala Cys Cys Ala Cys Cys Cys Trp Ala Pro
        435   440   445

Arg Ser Asp Leu Lys Asp Arg Pro Ala Arg Asp Gly Ala Thr Val Ser
        450   455   460

Arg Met Lys Leu Gln Val Trp Gly Thr Leu Thr Ser Leu Gly Ser Thr
465   470   475   480

Leu Pro Cys Arg Ser Leu Ser Ser His Lys Leu Pro Trp Val Thr Val
           485   490   495

Ser His His Asp Pro Glu Val Pro Phe Asn His Ser Phe Ile Glu Pro
        500   505   510

Pro Ser Ala Gly Trp Ala Thr Asp Asp Ser Phe Ser Ser Asp Pro Glu
        515   520   525

Ser Gly Glu Ala Asp Glu Val Pro Ala Tyr Cys Val Pro Pro Gln Glu
        530   535   540

Gly Met Val Pro Val Ala Gln Ala Gly Ser Ser Glu Ala Ser Leu Ala
545   550   555   560

Ala Gly Ala Phe Pro Pro Pro Glu Asp Ala Ser Thr Pro Phe Ala Ile
          565   570   575

Pro Arg Thr Ser Ser Leu Ala Arg Ala Lys Arg Pro Ser Val Ser Phe
        580   585   590

Ala Glu Gly Thr Lys Phe Ala Pro Gln Ser Arg Arg Ser Ser Gly Glu
        595   600   605

Leu Ser Ser Pro Leu Arg Lys Pro Lys Arg Leu Ser Arg Gly Ala Gln
        610   615   620

Ser Gly Pro Glu Gly Arg Glu Ala Glu Glu Ser Thr Gly Pro Asp Glu
625   630   635   640

Ala Glu Ala Pro Glu Ser Phe Pro Ala Ala Ala Ser Pro Gly Asp Ser
          645   650   655

```
Ala Thr Gly His Arg Arg Pro Pro Leu Gly Ser Arg Thr Val Ala Glu
            660                 665             670

His Val Glu Ala Ile Glu Gly Ser Val Gln Glu Ser Ser Gly Pro Val
            675                 680             685

Thr Thr Ile Tyr Met Leu Ala Gly Lys Pro Arg Gly Ser Glu Gly Pro
    690                 695             700

Val Arg Ser Val Phe Arg His Phe Gly Ser Phe Gln Lys Gly Gln Ala
705                 710             715                 720

Glu Ala Lys Val Lys Arg Ala Ile Pro Lys Pro Pro Arg Gln Ala Leu
            725                 730             735

Asn Arg Lys Lys Gly Ser Pro Gly Leu Ala Ser Gly Ser Val Gly Gln
            740                 745             750

Ser Pro Asn Ser Ala Pro Lys Ala Gly Leu Pro Gly Ala Thr Gly Pro
    755                 760             765

Met Ala Val Arg Pro Glu Glu Ala Val Arg Gly Leu Gly Ala Gly Thr
    770                 775             780

Glu Ser Ser Arg Arg Ala Gln Glu Pro Val Ser Gly Cys Gly Ser Pro
785                 790             795                 800

Glu Gln Asp Pro Gln Lys Gln Ala Glu Glu Glu Arg Gln Glu Glu Pro
            805                 810             815

Glu Tyr Glu Asn Val Val Pro Ile Ser Arg Pro Pro Glu Pro
            820                 825             830
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<210>  135
<211>  4503
<212>  DNA
<213>  Caenorhabditis elegans

<220>
<221>  CDS
<222>  (1)..(4503)
<223>
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<400> 135

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atg aag ttc att gga act tcc ggt tca att aca ttg gga gca gac atc          48
Met Lys Phe Ile Gly Thr Ser Gly Ser Ile Thr Leu Gly Ala Asp Ile
1               5                   10                  15

ata tgt cgg att ggt tgt cag ttc aat tat caa gca tct gca acc tgc          96
Ile Cys Arg Ile Gly Cys Gln Phe Asn Tyr Gln Ala Ser Ala Thr Cys
            20                  25                  30

aat tct gtt ggg gcg tct gtc gca act gta gtc acc gct gat aat cct         144
Asn Ser Val Gly Ala Ser Val Ala Thr Val Val Thr Ala Asp Asn Pro
        35                  40                  45

cga cgt tca gtg tct ttc cct att tat tgt gca agc tta gca tat gca         192
Arg Arg Ser Val Ser Phe Pro Ile Tyr Cys Ala Ser Leu Ala Tyr Ala
    50                  55                  60

agc agt aaa tac aac aat atc tcg tca gaa aca gtc gga atc gcc cat         240
Ser Ser Lys Tyr Asn Asn Ile Ser Ser Glu Thr Val Gly Ile Ala His
65                  70                  75                  80

ctg gaa cat aga caa tcc ctt gcg aaa gac ttc acg tgt tcc aat gcg         288
Leu Glu His Arg Gln Ser Leu Ala Lys Asp Phe Thr Cys Ser Asn Ala
                85                  90                  95

agc caa gaa aca ttt gga caa aga agt ttt gtt att ctt gct gaa aac         336
Ser Gln Glu Thr Phe Gly Gln Arg Ser Phe Val Ile Leu Ala Glu Asn
            100                 105                 110

aca aaa gac act gat gtg atg aaa agt tcc gtg gat aac gtt ttc aga         384
Thr Lys Asp Thr Asp Val Met Lys Ser Ser Val Asp Asn Val Phe Arg
        115                 120                 125

aac aag aat agt atc ttc tac cag ctt agt cct ttt gtc aac tct gct         432
Asn Lys Asn Ser Ile Phe Tyr Gln Leu Ser Pro Phe Val Asn Ser Ala
    130                 135                 140

cct cca cag cga tat gca aac ttt ttc gct gtt ctg aat aaa tgt tcc         480
Pro Pro Gln Arg Tyr Ala Asn Phe Phe Ala Val Leu Asn Lys Cys Ser
145                 150                 155                 160

gaa act gca caa acg gag caa agc tct gac tat gga acg ttt tta aca         528
Glu Thr Ala Gln Thr Glu Gln Ser Ser Asp Tyr Gly Thr Phe Leu Thr
                165                 170                 175

aaa gtt atg aat gtt act agt aaa tca caa caa cga ccc aat gat cca         576
Lys Val Met Asn Val Thr Ser Lys Ser Gln Gln Arg Pro Asn Asp Pro
            180                 185                 190

agt gat cct gtc aag gtc aca aat ttc ctg cct caa gca att gca gga         624
Ser Asp Pro Val Lys Val Thr Asn Phe Leu Pro Gln Ala Ile Ala Gly
        195                 200                 205
```

```
gcg aac gcc tat tct gac att ctg ctt gtg att aat tat aac gtg tct        672
Ala Asn Ala Tyr Ser Asp Ile Leu Leu Val Ile Asn Tyr Asn Val Ser
    210             215             220

acc att acc gac aac gat gct acc gaa atc aaa agt gca tta gaa aaa        720
Thr Ile Thr Asp Asn Asp Ala Thr Glu Ile Lys Ser Ala Leu Glu Lys
225             230             235             240

caa aga tct cga cta tac att ctt ttt gtt caa acg tat ttc aac tac        768
Gln Arg Ser Arg Leu Tyr Ile Leu Phe Val Gln Thr Tyr Phe Asn Tyr
            245             250             255

act gat act tac tat gcc atg aac aaa ctg gcg att gcg agt gga gga        816
Thr Asp Thr Tyr Tyr Ala Met Asn Lys Leu Ala Ile Ala Ser Gly Gly
            260             265             270

gtg gcg att cga gtg aac act tat gat gat ttg agc acg ttc ttt gca        864
Val Ala Ile Arg Val Asn Thr Tyr Asp Asp Leu Ser Thr Phe Phe Ala
            275             280             285

caa tac ttc cca ctt ctc gtt gca aat gac att gtc gca aaa gca tat        912
Gln Tyr Phe Pro Leu Leu Val Ala Asn Asp Ile Val Ala Lys Ala Tyr
    290             295             300

gct gaa aac cca aga cct gga gtt gcg ttg aat aat gtc aat cta ctt        960
Ala Glu Asn Pro Arg Pro Gly Val Ala Leu Asn Asn Val Asn Leu Leu
305             310             315             320

gct caa caa tat gtt ctt ctt gta aca aat gag gat tca ttg gga gat       1008
Ala Gln Gln Tyr Val Leu Leu Val Thr Asn Glu Asp Ser Leu Gly Asp
            325             330             335

ggc ccg gtg cca gca tcg gta act gtt acc ggg att aat gtt aca caa       1056
Gly Pro Val Pro Ala Ser Val Thr Val Thr Gly Ile Asn Val Thr Gln
            340             345             350

cta cca aca att ggc gaa ctt caa tta ttc act ctt att cca gaa aag       1104
Leu Pro Thr Ile Gly Glu Leu Gln Leu Phe Thr Leu Ile Pro Glu Lys
            355             360             365

gct gga aaa ttc act cca ttg ttc tat tca tct tca tct ttt gat gac       1152
Ala Gly Lys Phe Thr Pro Leu Phe Tyr Ser Ser Ser Ser Phe Asp Asp
    370             375             380

ggg tca aaa att acc att aca tac agt gat gca aca aac cca gca aat       1200
Gly Ser Lys Ile Thr Ile Thr Tyr Ser Asp Ala Thr Asn Pro Ala Asn
385             390             395             400

cca att tat aat gga aat att acg tct gct tta aat gac tgc aaa tat       1248
Pro Ile Tyr Asn Gly Asn Ile Thr Ser Ala Leu Asn Asp Cys Lys Tyr
            405             410             415

tat gca aac aca aaa aat tac gcc tgg gcc tgt agt att tcc gaa atc       1296
Tyr Ala Asn Thr Lys Asn Tyr Ala Trp Ala Cys Ser Ile Ser Glu Ile
            420             425             430
```

369

```
gca tta tta tta caa ttt tca atg aga aat att cag atc gat aga gtt        1344
Ala Leu Leu Leu Gln Phe Ser Met Arg Asn Ile Gln Ile Asp Arg Val
        435             440             445

ttg aac ggt gaa acg att tcg aga acc ttc cca att act tgc ctt gga        1392
Leu Asn Gly Glu Thr Ile Ser Arg Thr Phe Pro Ile Thr Cys Leu Gly
        450             455             460

gca gat gta gga gac tgc ctc aac ggt gga aat cta aca gat gct ggt        1440
Ala Asp Val Gly Asp Cys Leu Asn Gly Gly Asn Leu Thr Asp Ala Gly
465             470             475             480

tca tgc att tgc cca tta cag tgg aca gga act aac tgt caa gct ccg        1488
Ser Cys Ile Cys Pro Leu Gln Trp Thr Gly Thr Asn Cys Gln Ala Pro
                485             490             495

caa tgc ttg aat gga ggt aca ctg aaa act gat gac act tgt gca tgt        1536
Gln Cys Leu Asn Gly Gly Thr Leu Lys Thr Asp Asp Thr Cys Ala Cys
        500             505             510

ctc gat agt ttc aaa gga gat ttt tgt gaa aca agt acc tct gtt tgc        1584
Leu Asp Ser Phe Lys Gly Asp Phe Cys Glu Thr Ser Thr Ser Val Cys
        515             520             525

gct gga gct ccg aca tct ccg gac tat cgc tct gaa ctg agt tca ttg        1632
Ala Gly Ala Pro Thr Ser Pro Asp Tyr Arg Ser Glu Leu Ser Ser Leu
        530             535             540

gta att gtt gct gat gtc aac gca tta tca aca agt agt cta agc aat        1680
Val Ile Val Ala Asp Val Asn Ala Leu Ser Thr Ser Ser Leu Ser Asn
545             550             555             560

acg gta ccc gga ata act gga gtg cca att act gtc att cta tat ggc        1728
Thr Val Pro Gly Ile Thr Gly Val Pro Ile Thr Val Ile Leu Tyr Gly
                565             570             575

gat gga aat gct cca aga att gtt cag tct aca act aac agt gag cat        1776
Asp Gly Asn Ala Pro Arg Ile Val Gln Ser Thr Thr Asn Ser Glu His
                580             585             590

ctc tcc gag gta tta ggt gca ccg acg ggt acc aca act tca cca agt        1824
Leu Ser Glu Val Leu Gly Ala Pro Thr Gly Thr Thr Thr Ser Pro Ser
        595             600             605

tca acg gct tca cca gca cca tcc gca agt gat atg tat aag gct ctg        1872
Ser Thr Ala Ser Pro Ala Pro Ser Ala Ser Asp Met Tyr Lys Ala Leu
        610             615             620

aat ttg gca ctt gac aat cag ctc acc gac cgt gca ttt gta att gta        1920
Asn Leu Ala Leu Asp Asn Gln Leu Thr Asp Arg Ala Phe Val Ile Val
625             630             635             640

tac aca tca aat tcc aat gtc acc att gat cct gac ttt ttg atc cgt        1968
Tyr Thr Ser Asn Ser Asn Val Thr Ile Asp Pro Asp Phe Leu Ile Arg
                645             650             655
```

370

```
ttg gca gtc aga aga gcc gaa gta cga gtg ttg tca act tcg gga act    2016
Leu Ala Val Arg Arg Ala Glu Val Arg Val Leu Ser Thr Ser Gly Thr
            660             665             670

gaa agt caa aac tct ata aca tta tcg cta gtc gga aat gga att cct    2064
Glu Ser Gln Asn Ser Ile Thr Leu Ser Leu Val Gly Asn Gly Ile Pro
            675             680             685

att gcg ata aat ggc gcg aaa gat ttc gaa aat tac ctg aca tac tac    2112
Ile Ala Ile Asn Gly Ala Lys Asp Phe Glu Asn Tyr Leu Thr Tyr Tyr
            690             695             700

gtt gtt ccc tta ttc caa tca cta caa tac caa gtg aac act cca caa    2160
Val Val Pro Leu Phe Gln Ser Leu Gln Tyr Gln Val Asn Thr Pro Gln
705             710             715             720

cga gtg ttc aat gtg ttc caa aca ggt caa ttc tac aac tct acg caa    2208
Arg Val Phe Asn Val Phe Gln Thr Gly Gln Phe Tyr Asn Ser Thr Gln
            725             730             735

att tct atc cca gca gat tcc aca ttt gat aac gct aaa cca aat ctt    2256
Ile Ser Ile Pro Ala Asp Ser Thr Phe Asp Asn Ala Lys Pro Asn Leu
            740             745             750

ttt gtg cat gtg tac gaa ggt cgc att aat tat tca gat cct tca aca    2304
Phe Val His Val Tyr Glu Gly Arg Ile Asn Tyr Ser Asp Pro Ser Thr
            755             760             765

aat gga aac gag gtt ggc aat tct act ata tac ttt ctc cct tat gac    2352
Asn Gly Asn Glu Val Gly Asn Ser Thr Ile Tyr Phe Leu Pro Tyr Asp
            770             775             780

ccc aca aaa cct atc aac tta att gtg aat aat aat ggc acg acc ggt    2400
Pro Thr Lys Pro Ile Asn Leu Ile Val Asn Asn Asn Gly Thr Thr Gly
785             790             795             800

tac tac gca atc gaa gtc atc gga tat cta aag aca tca tat ggt ttc    2448
Tyr Tyr Ala Ile Glu Val Ile Gly Tyr Leu Lys Thr Ser Tyr Gly Phe
            805             810             815

aat att gat aat gct aac gga tca aat gaa aac ctg aac tcg gga gta    2496
Asn Ile Asp Asn Ala Asn Gly Ser Asn Glu Asn Leu Asn Ser Gly Val
            820             825             830

gta tat aac caa caa aac aca ttg aat atc tat tct gcg ccg ttt tca    2544
Val Tyr Asn Gln Gln Asn Thr Leu Asn Ile Tyr Ser Ala Pro Phe Ser
            835             840             845

cag ctt cct aaa act gat cca tca aac ttc cca tat ctc aca ctt gga    2592
Gln Leu Pro Lys Thr Asp Pro Ser Asn Phe Pro Tyr Leu Thr Leu Gly
            850             855             860

gaa att gcc agt aac gga aca gtt tta cct gca aca aca gtt ttg ttt    2640
Glu Ile Ala Ser Asn Gly Thr Val Leu Pro Ala Thr Thr Val Leu Phe
865             870             875             880
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371

```
aca aga aaa agt ggt gcg tcc tgt ttt tac agt cac ttc acc gtt ctt        2688
Thr Arg Lys Ser Gly Ala Ser Cys Phe Tyr Ser His Phe Thr Val Leu
                885                 890                 895

gat gtc tgc tcc caa agc aca aca att gga tat cag gca cag ttg acc        2736
Asp Val Cys Ser Gln Ser Thr Thr Ile Gly Tyr Gln Ala Gln Leu Thr
                900                 905                 910

aca aga aca agc acc ttg aca aat agg att caa caa ttt gtg ctg aca        2784
Thr Arg Thr Ser Thr Leu Thr Asn Arg Ile Gln Gln Phe Val Leu Thr
                915                 920                 925

tgc ttt aaa aca agt tat gca aat aat gat act tcc tgc cat gga cat        2832
Cys Phe Lys Thr Ser Tyr Ala Asn Asn Asp Thr Ser Cys His Gly His
            930                 935                 940

gga tca cca atg gca acc tgt gcc tgt aat gct gac ttc gga gga att        2880
Gly Ser Pro Met Ala Thr Cys Ala Cys Asn Ala Asp Phe Gly Gly Ile
945                 950                 955                 960

gat tgc act gaa ccg gct tgt gta aat gga ggt gtt cgg gat ggg tcg        2928
Asp Cys Thr Glu Pro Ala Cys Val Asn Gly Gly Val Arg Asp Gly Ser
                965                 970                 975

gtt tgt cgt tgt cct gta aga ttc tat ggg ctt cga tgt gaa gaa tgt        2976
Val Cys Arg Cys Pro Val Arg Phe Tyr Gly Leu Arg Cys Glu Glu Cys
                980                 985                 990

gag tct agg caa aat ctg cct ata aga aaa tta tcc aca cct aat tac        3024
Glu Ser Arg Gln Asn Leu Pro Ile Arg Lys Leu Ser Thr Pro Asn Tyr
                995                 1000                1005

gga caa att act gac aaa tta ctg gta aag aaa ttc att cag ttc           3069
Gly Gln Ile Thr Asp Lys Leu Leu Val Lys Lys Phe Ile Gln Phe
        1010                1015                1020

cct ttt gaa tca gaa cca gct tcg tct act gtc tcc gtg ata act           3114
Pro Phe Glu Ser Glu Pro Ala Ser Ser Thr Val Ser Val Ile Thr
        1025                1030                1035

tca act act atg ctg cct tct acg tca act gtt gct cca agc aca           3159
Ser Thr Thr Met Leu Pro Ser Thr Ser Thr Val Ala Pro Ser Thr
        1040                1045                1050

agc caa tca aca ata gtt tcc act gtt act aca cag tca cca agt           3204
Ser Gln Ser Thr Ile Val Ser Thr Val Thr Thr Gln Ser Pro Ser
        1055                1060                1065

cct tca aca aca gct cca aaa caa gtc cga gct gct gca ttc att           3249
Pro Ser Thr Thr Ala Pro Lys Gln Val Arg Ala Ala Ala Phe Ile
        1070                1075                1080

att gac tgc atg gga act gat gat tat gct ttc aat cag aca ttc           3294
Ile Asp Cys Met Gly Thr Asp Asp Tyr Ala Phe Asn Gln Thr Phe
        1085                1090                1095
```

372

```
aaa tcg att gca cag tac ttc aag aca ttt ggc tat agc cat tac        3339
Lys Ser Ile Ala Gln Tyr Phe Lys Thr Phe Gly Tyr Ser His Tyr
    1100             1105             1110

atc atg tta acc aat aat ttg aat gga agt tta caa ttg aac aat        3384
Ile Met Leu Thr Asn Asn Leu Asn Gly Ser Leu Gln Leu Asn Asn
    1115             1120             1125

gga agt tta cta ttt gaa gat ttc caa caa tat tca gat gag agt        3429
Gly Ser Leu Leu Phe Glu Asp Phe Gln Gln Tyr Ser Asp Glu Ser
    1130             1135             1140

atg att atg agc aaa cta ccc ctg tat tgg agt tta aga gcc acc        3474
Met Ile Met Ser Lys Leu Pro Leu Tyr Trp Ser Leu Arg Ala Thr
    1145             1150             1155

cca agt aga acc gct agc gtc agc aac gcg ctc agt aag att ctt        3519
Pro Ser Arg Thr Ala Ser Val Ser Asn Ala Leu Ser Lys Ile Leu
    1160             1165             1170

gca agt tac aat aga aac ggt aca gag ttc aaa aac tct gta agc        3564
Ala Ser Tyr Asn Arg Asn Gly Thr Glu Phe Lys Asn Ser Val Ser
    1175             1180             1185

atg aat att ttt tat gca act caa ata ggg ctg ggc gat gag gat        3609
Met Asn Ile Phe Tyr Ala Thr Gln Ile Gly Leu Gly Asp Glu Asp
    1190             1195             1200

cca act gca gca ggc tta gaa gtt ttc aac aag agc gcg att gta        3654
Pro Thr Ala Ala Gly Leu Glu Val Phe Asn Lys Ser Ala Ile Val
    1205             1210             1215

tat tct gca ttc gca aaa aat gcc aac cag aca att gtg act tct        3699
Tyr Ser Ala Phe Ala Lys Asn Ala Asn Gln Thr Ile Val Thr Ser
    1220             1225             1230

ctt caa aaa ttc agt acc gac gta acc act gct aga gat tat tac        3744
Leu Gln Lys Phe Ser Thr Asp Val Thr Thr Ala Arg Asp Tyr Tyr
    1235             1240             1245

agt ggt ctt tct gat atg tat gaa agc act caa ccc cag ggt tcg        3789
Ser Gly Leu Ser Asp Met Tyr Glu Ser Thr Gln Pro Gln Gly Ser
    1250             1255             1260

aat gag ctc cct cca aaa ccg gat caa ctt agt tgt gtg tac ggc        3834
Asn Glu Leu Pro Pro Lys Pro Asp Gln Leu Ser Cys Val Tyr Gly
    1265             1270             1275

ctg caa tcg aat atc aaa att gca att gat aga tcc aac tcg tca        3879
Leu Gln Ser Asn Ile Lys Ile Ala Ile Asp Arg Ser Asn Ser Ser
    1280             1285             1290

aac cca gag gtt aac aca att atg aat aat ttc ctt gtc aat ttc        3924
Asn Pro Glu Val Asn Thr Ile Met Asn Asn Phe Leu Val Asn Phe
    1295             1300             1305
```

373

```
cgt ctt  gga ttt aat tat att  gaa aat gat gac aac  aga tgc ggg      3969
Arg Leu  Gly Phe Asn Tyr Ile  Glu Asn Asp Asp Asn  Arg Cys Gly
    1310                 1315                 1320

gat aag  tta cca gaa ttt tat  acc gga cga act gca  tta acg gcg      4014
Asp Lys  Leu Pro Glu Phe Tyr  Thr Gly Arg Thr Ala  Leu Thr Ala
    1325                 1330                 1335

ttc ccg  tat tat gat gcc att  gca aaa ata gca aca  ttt tgt cca      4059
Phe Pro  Tyr Tyr Asp Ala Ile  Ala Lys Ile Ala Thr  Phe Cys Pro
    1340                 1345                 1350

tct caa  tac act tcg atg cta  tca ttc caa gtc gtc  gga agc caa      4104
Ser Gln  Tyr Thr Ser Met Leu  Ser Phe Gln Val Val  Gly Ser Gln
    1355                 1360                 1365

tta cag  cca aac ttc acc gat  aaa tat gtc aaa gtc  att agc aag      4149
Leu Gln  Pro Asn Phe Thr Asp  Lys Tyr Val Lys Val  Ile Ser Lys
    1370                 1375                 1380

aac att  aac agt gcc gat tgt  tcg tgc aac aga ttc  aac gac act      4194
Asn Ile  Asn Ser Ala Asp Cys  Ser Cys Asn Arg Phe  Asn Asp Thr
    1385                 1390                 1395

aac act  gcg aag ttt atc att  tgg atg cct cgt tct  gca gcg ccc      4239
Asn Thr  Ala Lys Phe Ile Ile  Trp Met Pro Arg Ser  Ala Ala Pro
    1400                 1405                 1410

gtc act  gat gat gat tat tta  acc ttg ctc aaa ctc  aac acc aca      4284
Val Thr  Asp Asp Asp Tyr Leu  Thr Leu Leu Lys Leu  Asn Thr Thr
    1415                 1420                 1425

aat gca  tat cac ttt gtc gtt  cca ttt tac gat agt  gct gat aac      4329
Asn Ala  Tyr His Phe Val Val  Pro Phe Tyr Asp Ser  Ala Asp Asn
    1430                 1435                 1440

agt acc  gat ttg tac tac cag  att ctt gtg aag caa  gca gga ccc      4374
Ser Thr  Asp Leu Tyr Tyr Gln  Ile Leu Val Lys Gln  Ala Gly Pro
    1445                 1450                 1455

gaa ggt  ccc gat tat tat tgg  tta cca aat gca gtt  aat gct aca      4419
Glu Gly  Pro Asp Tyr Tyr Trp  Leu Pro Asn Ala Val  Asn Ala Thr
    1460                 1465                 1470

aat ttg  caa acg aat gta ata  aat att cta tac gag  aag ctt tgc      4464
Asn Leu  Gln Thr Asn Val Ile  Asn Ile Leu Tyr Glu  Lys Leu Cys
    1475                 1480                 1485

caa act  gcc ggt gtt gac cca  aca gca atc cca cca  taa              4503
Gln Thr  Ala Gly Val Asp Pro  Thr Ala Ile Pro Pro
    1490                 1495                 1500
```

374

<210> 136
<211> 1500
<212> PRT
<213> Caenorhabditis elegans

<400> 136

Met Lys Phe Ile Gly Thr Ser Gly Ser Ile Thr Leu Gly Ala Asp Ile
1   5   10   15

Ile Cys Arg Ile Gly Cys Gln Phe Asn Tyr Gln Ala Ser Ala Thr Cys
            20   25   30

Asn Ser Val Gly Ala Ser Val Ala Thr Val Val Thr Ala Asp Asn Pro
        35   40   45

Arg Arg Ser Val Ser Phe Pro Ile Tyr Cys Ala Ser Leu Ala Tyr Ala
    50   55   60

Ser Ser Lys Tyr Asn Asn Ile Ser Ser Glu Thr Val Gly Ile Ala His
65   70   75   80

Leu Glu His Arg Gln Ser Leu Ala Lys Asp Phe Thr Cys Ser Asn Ala
            85   90   95

Ser Gln Glu Thr Phe Gly Gln Arg Ser Phe Val Ile Leu Ala Glu Asn
            100   105   110

Thr Lys Asp Thr Asp Val Met Lys Ser Ser Val Asp Asn Val Phe Arg
        115   120   125

Asn Lys Asn Ser Ile Phe Tyr Gln Leu Ser Pro Phe Val Asn Ser Ala
    130   135   140

Pro Pro Gln Arg Tyr Ala Asn Phe Phe Ala Val Leu Asn Lys Cys Ser
145   150   155   160

Glu Thr Ala Gln Thr Glu Gln Ser Ser Asp Tyr Gly Thr Phe Leu Thr
            165   170   175

Lys Val Met Asn Val Thr Ser Lys Ser Gln Gln Arg Pro Asn Asp Pro
            180   185   190

375

Ser Asp Pro Val Lys Val Thr Asn Phe Leu Pro Gln Ala Ile Ala Gly
        195   200   205

Ala Asn Ala Tyr Ser Asp Ile Leu Leu Val Ile Asn Tyr Asn Val Ser
        210   215   220

Thr Ile Thr Asp Asn Asp Ala Thr Glu Ile Lys Ser Ala Leu Glu Lys
225   230   235   240

Gln Arg Ser Arg Leu Tyr Ile Leu Phe Val Gln Thr Tyr Phe Asn Tyr
            245   250   255

Thr Asp Thr Tyr Tyr Ala Met Asn Lys Leu Ala Ile Ala Ser Gly Gly
        260   265   270

Val Ala Ile Arg Val Asn Thr Tyr Asp Asp Leu Ser Thr Phe Phe Ala
        275   280   285

Gln Tyr Phe Pro Leu Leu Val Ala Asn Asp Ile Val Ala Lys Ala Tyr
    290   295   300

Ala Glu Asn Pro Arg Pro Gly Val Ala Leu Asn Asn Val Asn Leu Leu
305   310   315   320

Ala Gln Gln Tyr Val Leu Leu Val Thr Asn Glu Asp Ser Leu Gly Asp
            325   330   335

Gly Pro Val Pro Ala Ser Val Thr Val Thr Gly Ile Asn Val Thr Gln
            340   345   350

Leu Pro Thr Ile Gly Glu Leu Gln Leu Phe Thr Leu Ile Pro Glu Lys
        355   360   365

Ala Gly Lys Phe Thr Pro Leu Phe Tyr Ser Ser Ser Ser Phe Asp Asp
    370   375   380

Gly Ser Lys Ile Thr Ile Thr Tyr Ser Asp Ala Thr Asn Pro Ala Asn
385   390   395   400

Pro Ile Tyr Asn Gly Asn Ile Thr Ser Ala Leu Asn Asp Cys Lys Tyr
            405   410   415

376

Tyr Ala Asn Thr Lys Asn Tyr Ala Trp Ala Cys Ser Ile Ser Glu Ile
            420   425   430

Ala Leu Leu Leu Gln Phe Ser Met Arg Asn Ile Gln Ile Asp Arg Val
        435   440   445

Leu Asn Gly Glu Thr Ile Ser Arg Thr Phe Pro Ile Thr Cys Leu Gly
        450   455   460

Ala Asp Val Gly Asp Cys Leu Asn Gly Gly Asn Leu Thr Asp Ala Gly
465   470   475   480

Ser Cys Ile Cys Pro Leu Gln Trp Thr Gly Thr Asn Cys Gln Ala Pro
            485   490   495

Gln Cys Leu Asn Gly Gly Thr Leu Lys Thr Asp Asp Thr Cys Ala Cys
            500   505   510

Leu Asp Ser Phe Lys Gly Asp Phe Cys Glu Thr Ser Thr Ser Val Cys
        515   520   525

Ala Gly Ala Pro Thr Ser Pro Asp Tyr Arg Ser Glu Leu Ser Ser Leu
        530   535   540

Val Ile Val Ala Asp Val Asn Ala Leu Ser Thr Ser Ser Leu Ser Asn
545   550   555   560

Thr Val Pro Gly Ile Thr Gly Val Pro Ile Thr Val Ile Leu Tyr Gly
                565   570   575

Asp Gly Asn Ala Pro Arg Ile Val Gln Ser Thr Thr Asn Ser Glu His
            580   585   590

Leu Ser Glu Val Leu Gly Ala Pro Thr Gly Thr Thr Thr Ser Pro Ser
        595   600   605

Ser Thr Ala Ser Pro Ala Pro Ser Ala Ser Asp Met Tyr Lys Ala Leu
        610   615   620

Asn Leu Ala Leu Asp Asn Gln Leu Thr Asp Arg Ala Phe Val Ile Val
625   630   635   640

377

```
Tyr Thr Ser Asn Ser Asn Val Thr Ile Asp Pro Asp Phe Leu Ile Arg
            645             650             655

Leu Ala Val Arg Arg Ala Glu Val Arg Val Leu Ser Thr Ser Gly Thr
            660             665             670

Glu Ser Gln Asn Ser Ile Thr Leu Ser Leu Val Gly Asn Gly Ile Pro
            675             680             685

Ile Ala Ile Asn Gly Ala Lys Asp Phe Glu Asn Tyr Leu Thr Tyr Tyr
            690             695             700

Val Val Pro Leu Phe Gln Ser Leu Gln Tyr Gln Val Asn Thr Pro Gln
705             710             715             720

Arg Val Phe Asn Val Phe Gln Thr Gly Gln Phe Tyr Asn Ser Thr Gln
            725             730             735

Ile Ser Ile Pro Ala Asp Ser Thr Phe Asp Asn Ala Lys Pro Asn Leu
            740             745             750

Phe Val His Val Tyr Glu Gly Arg Ile Asn Tyr Ser Asp Pro Ser Thr
            755             760             765

Asn Gly Asn Glu Val Gly Asn Ser Thr Ile Tyr Phe Leu Pro Tyr Asp
            770             775             780

Pro Thr Lys Pro Ile Asn Leu Ile Val Asn Asn Asn Gly Thr Thr Gly
785             790             795             800

Tyr Tyr Ala Ile Glu Val Ile Gly Tyr Leu Lys Thr Ser Tyr Gly Phe
            805             810             815

Asn Ile Asp Asn Ala Asn Gly Ser Asn Glu Asn Leu Asn Ser Gly Val
            820             825             830

Val Tyr Asn Gln Gln Asn Thr Leu Asn Ile Tyr Ser Ala Pro Phe Ser
            835             840             845

Gln Leu Pro Lys Thr Asp Pro Ser Asn Phe Pro Tyr Leu Thr Leu Gly
    850             855             860
```

378

```
Glu Ile Ala Ser Asn Gly Thr Val Leu Pro Ala Thr Thr Val Leu Phe
865             870             875                 880

Thr Arg Lys Ser Gly Ala Ser Cys Phe Tyr Ser His Phe Thr Val Leu
            885             890                 895

Asp Val Cys Ser Gln Ser Thr Thr Ile Gly Tyr Gln Ala Gln Leu Thr
            900             905                 910

Thr Arg Thr Ser Thr Leu Thr Asn Arg Ile Gln Gln Phe Val Leu Thr
            915             920                 925

Cys Phe Lys Thr Ser Tyr Ala Asn Asn Asp Thr Ser Cys His Gly His
    930             935             940

Gly Ser Pro Met Ala Thr Cys Ala Cys Asn Ala Asp Phe Gly Gly Ile
945             950             955                 960

Asp Cys Thr Glu Pro Ala Cys Val Asn Gly Gly Val Arg Asp Gly Ser
            965             970                 975

Val Cys Arg Cys Pro Val Arg Phe Tyr Gly Leu Arg Cys Glu Glu Cys
            980             985                 990

Glu Ser Arg Gln Asn Leu Pro Ile Arg Lys Leu Ser Thr Pro Asn Tyr
    995             1000            1005

Gly Gln Ile Thr Asp Lys Leu Leu Val Lys Lys Phe Ile Gln Phe
    1010            1015            1020

Pro Phe Glu Ser Glu Pro Ala Ser Ser Thr Val Ser Val Ile Thr
    1025            1030            1035

Ser Thr Thr Met Leu Pro Ser Thr Ser Thr Val Ala Pro Ser Thr
    1040            1045            1050

Ser Gln Ser Thr Ile Val Ser Thr Val Thr Thr Gln Ser Pro Ser
    1055            1060            1065

Pro Ser Thr Thr Ala Pro Lys Gln Val Arg Ala Ala Ala Phe Ile
    1070            1075            1080
```

379

```
Ile Asp  Cys Met Gly Thr Asp  Asp Tyr Ala Phe Asn  Gln Thr Phe
    1085             1090             1095

Lys Ser  Ile Ala Gln Tyr Phe  Lys Thr Phe Gly Tyr  Ser His Tyr
    1100             1105             1110

Ile Met  Leu Thr Asn Asn Leu  Asn Gly Ser Leu Gln  Leu Asn Asn
    1115             1120             1125

Gly Ser  Leu Leu Phe Glu Asp  Phe Gln Gln Tyr Ser  Asp Glu Ser
    1130             1135             1140

Met Ile  Met Ser Lys Leu Pro  Leu Tyr Trp Ser Leu  Arg Ala Thr
    1145             1150             1155

Pro Ser  Arg Thr Ala Ser Val  Ser Asn Ala Leu Ser  Lys Ile Leu
    1160             1165             1170

Ala Ser  Tyr Asn Arg Asn Gly  Thr Glu Phe Lys Asn  Ser Val Ser
    1175             1180             1185

Met Asn  Ile Phe Tyr Ala Thr  Gln Ile Gly Leu Gly  Asp Glu Asp
    1190             1195             1200

Pro Thr  Ala Ala Gly Leu Glu  Val Phe Asn Lys Ser  Ala Ile Val
    1205             1210             1215

Tyr Ser  Ala Phe Ala Lys Asn  Ala Asn Gln Thr Ile  Val Thr Ser
    1220             1225             1230

Leu Gln  Lys Phe Ser Thr Asp  Val Thr Thr Ala Arg  Asp Tyr Tyr
    1235             1240             1245

Ser Gly  Leu Ser Asp Met Tyr  Glu Ser Thr Gln Pro  Gln Gly Ser
    1250             1255             1260

Asn Glu  Leu Pro Pro Lys Pro  Asp Gln Leu Ser Cys  Val Tyr Gly
    1265             1270             1275

Leu Gln  Ser Asn Ile Lys Ile  Ala Ile Asp Arg Ser  Asn Ser Ser
    1280             1285             1290
```

380

```
Asn Pro  Glu Val Asn Thr Ile  Met Asn Asn Phe Leu  Val Asn Phe
    1295             1300               1305

Arg Leu  Gly Phe Asn Tyr Ile  Glu Asn Asp Asp Asn  Arg Cys Gly
    1310             1315               1320

Asp Lys  Leu Pro Glu Phe Tyr  Thr Gly Arg Thr Ala  Leu Thr Ala
    1325             1330               1335

Phe Pro  Tyr Tyr Asp Ala Ile  Ala Lys Ile Ala Thr  Phe Cys Pro
    1340             1345               1350

Ser Gln  Tyr Thr Ser Met Leu  Ser Phe Gln Val Val  Gly Ser Gln
    1355             1360               1365

Leu Gln  Pro Asn Phe Thr Asp  Lys Tyr Val Lys Val  Ile Ser Lys
    1370             1375               1380

Asn Ile  Asn Ser Ala Asp Cys  Ser Cys Asn Arg Phe  Asn Asp Thr
    1385             1390               1395

Asn Thr  Ala Lys Phe Ile Ile  Trp Met Pro Arg Ser  Ala Ala Pro
    1400             1405               1410

Val Thr  Asp Asp Asp Tyr Leu  Thr Leu Leu Lys Leu  Asn Thr Thr
    1415             1420               1425

Asn Ala  Tyr His Phe Val Val  Pro Phe Tyr Asp Ser  Ala Asp Asn
    1430             1435               1440

Ser Thr  Asp Leu Tyr Tyr Gln  Ile Leu Val Lys Gln  Ala Gly Pro
    1445             1450               1455

Glu Gly  Pro Asp Tyr Tyr Trp  Leu Pro Asn Ala Val  Asn Ala Thr
    1460             1465               1470

Asn Leu  Gln Thr Asn Val Ile  Asn Ile Leu Tyr Glu  Lys Leu Cys
    1475             1480               1485

Gln Thr  Ala Gly Val Asp Pro  Thr Ala Ile Pro Pro
    1490             1495               1500
```

381

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<210>  137
<211>  369
<212>  DNA
<213>  Homo sapiens

<220>
<221>  CDS
<222>  (89)..(268)
<223>

<400>  137
gtattaagct caatattagc attaatccat ttatttgtta aaatctaata ttgtattctt      60

gtcttaaaca gtgactttgt ttttgtag gct gca tcc cat atc tat caa aat         112
                                 Ala Ala Ser His Ile Tyr Gln Asn
                                 1               5

caa ttt gtt caa atg atc ctc aat tca ctt att aac aag tca aaa tct        160
Gln Phe Val Gln Met Ile Leu Asn Ser Leu Ile Asn Lys Ser Lys Ser
    10              15                  20

tct atg ttc caa gtc aga act ttg aga gaa ctg tta tgg ggc tat agg       208
Ser Met Phe Gln Val Arg Thr Leu Arg Glu Leu Leu Trp Gly Tyr Arg
25              30                  35                  40

gat cca ttt ttg agt ttg gtt ccg tac cct gtt act acc aca gtt ggt       256
Asp Pro Phe Leu Ser Leu Val Pro Tyr Pro Val Thr Thr Thr Val Gly
                45                  50                  55

ctg ttt tat cct gtaagtacca aatatgaatg gcaatattat tacattttaa           308
Leu Phe Tyr Pro
            60

tttaattaat tcaatggcat tggcaaggca taattttata atttagctca ttagctatgc      368

t                                                                      369


<210>  138
<211>  60
<212>  PRT
<213>  Homo sapiens

<400>  138

Ala Ala Ser His Ile Tyr Gln Asn Gln Phe Val Gln Met Ile Leu Asn
1               5                   10                  15


Ser Leu Ile Asn Lys Ser Lys Ser Ser Met Phe Gln Val Arg Thr Leu
                20                  25                  30


Arg Glu Leu Leu Trp Gly Tyr Arg Asp Pro Phe Leu Ser Leu Val Pro
        35                  40                  45
```

382

```
Tyr Pro Val Thr Thr Thr Val Gly Leu Phe Tyr Pro
    50                  55                  60


<210>  139
<211>  3412
<212>  DNA
<213>  Homo sapiens

<220>
<221>  CDS
<222>  (27)..(2519)
<223>

<400>  139
cgagcgctcc caccgagctg cctgcc atg ggg ctg ggg ctg ctg ctc ccg ctg          53
                             Met Gly Leu Gly Leu Leu Leu Pro Leu
                              1               5


ctg ctg ctc tgg act cgg ggg act cag ggg tcc gag ctg gac ccc aaa         101
Leu Leu Leu Trp Thr Arg Gly Thr Gln Gly Ser Glu Leu Asp Pro Lys
10                  15                  20                  25


ggg cag cac gtc tgt gtg gcc agc agc ccc tct gct gag ctg cag tgc         149
Gly Gln His Val Cys Val Ala Ser Ser Pro Ser Ala Glu Leu Gln Cys
                30                  35                  40


tgc gca ggc tgg agg cag aag gat caa gaa tgc acc atc ccc atc tgt         197
Cys Ala Gly Trp Arg Gln Lys Asp Gln Glu Cys Thr Ile Pro Ile Cys
            45                  50                  55


gag ggg ccg gac gcc tgc cag aaa gac gag gtg tgt gtg aag ccg ggc         245
Glu Gly Pro Asp Ala Cys Gln Lys Asp Glu Val Cys Val Lys Pro Gly
        60                  65                  70


ctc tgt cga tgc aag cct gga ttc ttt ggg gcc cac tgc agc tcc cgc         293
Leu Cys Arg Cys Lys Pro Gly Phe Phe Gly Ala His Cys Ser Ser Arg
    75                  80                  85


tgc ccg ggc cag tac tgg ggc ccc gac tgc cgt gag agc tgc ccc tgc         341
Cys Pro Gly Gln Tyr Trp Gly Pro Asp Cys Arg Glu Ser Cys Pro Cys
90                  95                  100                 105


cac ccg cac ggc cag tgc gag cca gcc acg ggc gcg tgc cag tgc cag         389
His Pro His Gly Gln Cys Glu Pro Ala Thr Gly Ala Cys Gln Cys Gln
                110                 115                 120


gcc gac cgc tgg gga gcc cgc tgc gag ttc ccg tgc gcc tgc ggc ccc         437
Ala Asp Arg Trp Gly Ala Arg Cys Glu Phe Pro Cys Ala Cys Gly Pro
            125                 130                 135


cac ggg cgc tgc gac ccc gcg acc ggc gtg tgc cac tgc gaa ccc ggc         485
His Gly Arg Cys Asp Pro Ala Thr Gly Val Cys His Cys Glu Pro Gly
            140                 145                 150
```

383

```
tgg tgg tcg tcc acg tgc cgc cgc ccg tgc cag tgc aac acc gcg gcg        533
Trp Trp Ser Ser Thr Cys Arg Arg Pro Cys Gln Cys Asn Thr Ala Ala
    155             160             165

gcg cgc tgc gag cag gcc acg ggc gcc tgc gtg tgc aag ccg ggc tgg        581
Ala Arg Cys Glu Gln Ala Thr Gly Ala Cys Val Cys Lys Pro Gly Trp
170             175             180             185

tgg ggg cgc cgc tgc agc ttc cgc tgc aac tgc cac ggc tcc ccg tgc        629
Trp Gly Arg Arg Cys Ser Phe Arg Cys Asn Cys His Gly Ser Pro Cys
            190             195             200

gag cag gac tcc ggc cgc tgc gcc tgc cgg ccg ggc tgg tgg ggt ccc        677
Glu Gln Asp Ser Gly Arg Cys Ala Cys Arg Pro Gly Trp Trp Gly Pro
            205             210             215

gaa tgc cag cag cag tgc gag tgt gtg cgg ggc cgc tgc agc gcc gcc        725
Glu Cys Gln Gln Gln Cys Glu Cys Val Arg Gly Arg Cys Ser Ala Ala
        220             225             230

tcc ggc gag tgc acc tgc ccg ccc ggc ttc cgc gga gcg cgc tgc gag        773
Ser Gly Glu Cys Thr Cys Pro Pro Gly Phe Arg Gly Ala Arg Cys Glu
    235             240             245

ctg ccc tgc ccg gca ggc agc cac ggg gtg cag tgc gca cac agc tgt        821
Leu Pro Cys Pro Ala Gly Ser His Gly Val Gln Cys Ala His Ser Cys
250             255             260             265

ggc cgc tgc aaa cac aat gag ccg tgc tct cca gac aca ggc agc tgt        869
Gly Arg Cys Lys His Asn Glu Pro Cys Ser Pro Asp Thr Gly Ser Cys
            270             275             280

gag tcc tgc gag ccg ggc tgg aac ggg acc cag tgc cag cag ccc tgc        917
Glu Ser Cys Glu Pro Gly Trp Asn Gly Thr Gln Cys Gln Gln Pro Cys
            285             290             295

ctg cct ggc acc ttt ggc gag agc tgc gaa cag cag tgc cct cac tgc        965
Leu Pro Gly Thr Phe Gly Glu Ser Cys Glu Gln Gln Cys Pro His Cys
        300             305             310

cga cat ggg gag gcc tgt gag cca gat act ggc cac tgt cag cgc tgt        1013
Arg His Gly Glu Ala Cys Glu Pro Asp Thr Gly His Cys Gln Arg Cys
    315             320             325

gac cct ggc tgg ctg ggg ccc agg tgt gaa gac ccc tgc ccc act ggt        1061
Asp Pro Gly Trp Leu Gly Pro Arg Cys Glu Asp Pro Cys Pro Thr Gly
330             335             340             345

acc ttt ggg gaa gac tgt ggc tct acc tgc ccc acc tgt gtt cag ggg        1109
Thr Phe Gly Glu Asp Cys Gly Ser Thr Cys Pro Thr Cys Val Gln Gly
            350             355             360

tcc tgt gat act gtg aca ggg gac tgt gtc tgc agt gcc ggc tac tgg       1157
Ser Cys Asp Thr Val Thr Gly Asp Cys Val Cys Ser Ala Gly Tyr Trp
            365             370             375
```

384

```
ggg ccc agc tgc aac gcc tcc tgc cca gcc ggt ttc cat gga aac aac     1205
Gly Pro Ser Cys Asn Ala Ser Cys Pro Ala Gly Phe His Gly Asn Asn
        380                 385                 390

tgc tca gtt cct tgt gaa tgc cca gag gga ctc tgc cac cct gtc tct     1253
Cys Ser Val Pro Cys Glu Cys Pro Glu Gly Leu Cys His Pro Val Ser
        395                 400                 405

ggg tcc tgc cag cca ggc tct ggc agt cgg gac act gcc ctc atc gcg     1301
Gly Ser Cys Gln Pro Gly Ser Gly Ser Arg Asp Thr Ala Leu Ile Ala
410                 415                 420                 425

ggc agc ctt gtg cct ctg ctg ctg ctc ttc ctg ggc ctt gcc tgc tgt     1349
Gly Ser Leu Val Pro Leu Leu Leu Leu Phe Leu Gly Leu Ala Cys Cys
                430                 435                 440

gcc tgc tgc tgc tgg gcc ccc cga tca gac ctc aag gac agg cca gcg     1397
Ala Cys Cys Cys Trp Ala Pro Arg Ser Asp Leu Lys Asp Arg Pro Ala
                445                 450                 455

aga gat gga gct acc gtg tcc agg atg aag ctg cag gtc tgg ggg aca     1445
Arg Asp Gly Ala Thr Val Ser Arg Met Lys Leu Gln Val Trp Gly Thr
            460                 465                 470

ctg acc agc ttg ggc tcc acg ctg ccc tgc cgt tcc ctc agc tcc cac     1493
Leu Thr Ser Leu Gly Ser Thr Leu Pro Cys Arg Ser Leu Ser Ser His
        475                 480                 485

aag cta ccc tgg gtg aca gtc tca cat cac gac ccg gag gtc ccc ttc     1541
Lys Leu Pro Trp Val Thr Val Ser His His Asp Pro Glu Val Pro Phe
490                 495                 500                 505

aac cac agc ttc atc gag ccg ccc tct gcc ggc tgg gcc act gat gac     1589
Asn His Ser Phe Ile Glu Pro Pro Ser Ala Gly Trp Ala Thr Asp Asp
                510                 515                 520

tcc ttc tca tcc gat cct gag tct gga gag gca gat gag gtt cct gcc     1637
Ser Phe Ser Ser Asp Pro Glu Ser Gly Glu Ala Asp Glu Val Pro Ala
                525                 530                 535

tac tgt gtg cca ccc caa gaa ggg atg gtc cct gtg gcc cag gca ggg     1685
Tyr Cys Val Pro Pro Gln Glu Gly Met Val Pro Val Ala Gln Ala Gly
        540                 545                 550

tcg tca gag gcc agc ctg gct gca ggt gct ttc ccg ccc cct gag gac     1733
Ser Ser Glu Ala Ser Leu Ala Ala Gly Ala Phe Pro Pro Pro Glu Asp
        555                 560                 565

gcc tcc acg cca ttc gcc atc ccg cgc acc tcc agc cta gct cgg gcc     1781
Ala Ser Thr Pro Phe Ala Ile Pro Arg Thr Ser Ser Leu Ala Arg Ala
570                 575                 580                 585

aag cgg cca tcg gtc tcc ttc gcg gaa ggt acc aag ttt gca cca cag     1829
Lys Arg Pro Ser Val Ser Phe Ala Glu Gly Thr Lys Phe Ala Pro Gln
                590                 595                 600
```

```
agt cgc cga agc tca ggg gag ctc tcc agc ccg ctc cga aag ccc aag     1877
Ser Arg Arg Ser Ser Gly Glu Leu Ser Ser Pro Leu Arg Lys Pro Lys
                605                 610                 615

agg ctc tcc cgg ggg gcg cag tcg ggt cct gag ggc cgg gaa gcc gaa     1925
Arg Leu Ser Arg Gly Ala Gln Ser Gly Pro Glu Gly Arg Glu Ala Glu
                620                 625                 630

gag tcc aca ggc cca gag gaa gca gaa gcc ccc gag tcc ttt ccg gcg     1973
Glu Ser Thr Gly Pro Glu Glu Ala Glu Ala Pro Glu Ser Phe Pro Ala
                635                 640                 645

gct gcc agt ccc ggg gat tca gcc act ggc cac cgg cgg ccc cca ctt     2021
Ala Ala Ser Pro Gly Asp Ser Ala Thr Gly His Arg Arg Pro Pro Leu
650                 655                 660                 665

ggt ggc cgg aca gtg gct gag cac gtg gaa gcc att gag ggc agc gtc     2069
Gly Gly Arg Thr Val Ala Glu His Val Glu Ala Ile Glu Gly Ser Val
                670                 675                 680

cag gag agc tcg ggc cct gtg acc acg atc tac atg ctg gca ggg aag     2117
Gln Glu Ser Ser Gly Pro Val Thr Thr Ile Tyr Met Leu Ala Gly Lys
                685                 690                 695

ccc cgc gga tcc gaa ggc cct gtc cgc tct gtc ttc cgc cat ttt ggt     2165
Pro Arg Gly Ser Glu Gly Pro Val Arg Ser Val Phe Arg His Phe Gly
                700                 705                 710

agc ttc cag aaa ggc cag gcg gaa gcc aag gtc aag agg gcc atc cct     2213
Ser Phe Gln Lys Gly Gln Ala Glu Ala Lys Val Lys Arg Ala Ile Pro
                715                 720                 725

aag cct ccg cgc cag gcc ctg aat cgg aaa aag ggc agc cct ggc ctt     2261
Lys Pro Pro Arg Gln Ala Leu Asn Arg Lys Lys Gly Ser Pro Gly Leu
730                 735                 740                 745

gcc tct ggc tct gtc ggc cag agc ccc aac tca gcc cca aaa gct ggg     2309
Ala Ser Gly Ser Val Gly Gln Ser Pro Asn Ser Ala Pro Lys Ala Gly
                750                 755                 760

ctt cct ggg gcc aca ggg cct atg gca gtc aga cca gag gaa gcg gtc     2357
Leu Pro Gly Ala Thr Gly Pro Met Ala Val Arg Pro Glu Glu Ala Val
                765                 770                 775

cgg ggg ctg ggg gct ggc acc gag agt tca agg aga gcc cag gag cca     2405
Arg Gly Leu Gly Ala Gly Thr Glu Ser Ser Arg Arg Ala Gln Glu Pro
                780                 785                 790

gtc tct ggc tgt ggc tcc cca gaa cag gat ccc cag aag cag gct gaa     2453
Val Ser Gly Cys Gly Ser Pro Glu Gln Asp Pro Gln Lys Gln Ala Glu
                795                 800                 805

gag gaa agg cag gag gaa cct gag tat gag aat gtt gta ccc atc tcc     2501
Glu Glu Arg Gln Glu Glu Pro Glu Tyr Glu Asn Val Val Pro Ile Ser
810                 815                 820                 825
```

386

```
agg cca cca gaa ccc tga tgaccttgaa tttggggagt ggggagagtg          2549
Arg Pro Pro Glu Pro
                830

gatggactag actgtgctgt gtgctggaaa atgatcccgg ggccaggaca gacaaaccag   2609

agcctctgcg cctccacagg gaaaaggcaa ggcttccagg ccagttggcc caggcccctg   2669

gcagtgctcc cggaggggcc caggaaggcc tgggcagaga ccctgtagga tggggtcagg   2729

aagggttgcc tgcagggact tttgctctgc tgtcctggac cctgtgtgcc tcataagggc   2789

tattctttct ttcacgtgca aaacattttt ctgaaatagc aaacaaccta catgtttgct   2849

gataaaagat tggctaaaca aatttttttt ttttttttg agacagaatc tccctctgtc   2909

ccccaggctg gagtgcagtg gtgcgatctc ggctcactgc aagctctgcc tcccgggttc   2969

acgcccttct cctgcctcag cctcccgagt agctgggact acaggtgccc tccaccacgc   3029

ttggctaatt ttttgtata tttaatagag acagggtttc accatgttag ccaggatggt   3089

ctcgatctcc tgacctcgtg atccacctgc ctcggcctcc caaagtgctg ggatgacagg   3149

catgagccac cacgcctggt ctatgaactt tttaaaaagg atgtatgtgt ataaaaacag   3209

attcaaggga aaggcactaa atggtttttt cctctggaag atgagattgt aggtgatatt   3269

tattttcttc tgaaactttt gtatagtttg caaattttct acagtgaaca ttctttttta   3329

cttttgttac tagattgaat ttgataaagt ataataaaaa gcaatgatct ttgttaaaaa   3389

aataaaaagt actaacatta cag                                         3412
```

<210> 140
<211> 830
<212> PRT
<213> Homo sapiens

<400> 140

```
Met Gly Leu Gly Leu Leu Leu Pro Leu Leu Leu Leu Trp Thr Arg Gly
1               5                   10                  15


Thr Gln Gly Ser Glu Leu Asp Pro Lys Gly Gln His Val Cys Val Ala
            20                  25                  30


Ser Ser Pro Ser Ala Glu Leu Gln Cys Cys Ala Gly Trp Arg Gln Lys
        35                  40                  45
```

387

Asp Gln Glu Cys Thr Ile Pro Ile Cys Glu Gly Pro Asp Ala Cys Gln
    50   55   60

Lys Asp Glu Val Cys Val Lys Pro Gly Leu Cys Arg Cys Lys Pro Gly
65   70   75   80

Phe Phe Gly Ala His Cys Ser Ser Arg Cys Pro Gly Gln Tyr Trp Gly
                85   90   95

Pro Asp Cys Arg Glu Ser Cys Pro Cys His Pro His Gly Gln Cys Glu
            100   105   110

Pro Ala Thr Gly Ala Cys Gln Cys Gln Ala Asp Arg Trp Gly Ala Arg
            115   120   125

Cys Glu Phe Pro Cys Ala Cys Gly Pro His Gly Arg Cys Asp Pro Ala
    130   135   140

Thr Gly Val Cys His Cys Glu Pro Gly Trp Trp Ser Ser Thr Cys Arg
145   150   155   160

Arg Pro Cys Gln Cys Asn Thr Ala Ala Ala Arg Cys Glu Gln Ala Thr
            165   170   175

Gly Ala Cys Val Cys Lys Pro Gly Trp Trp Gly Arg Arg Cys Ser Phe
            180   185   190

Arg Cys Asn Cys His Gly Ser Pro Cys Glu Gln Asp Ser Gly Arg Cys
        195   200   205

Ala Cys Arg Pro Gly Trp Trp Gly Pro Glu Cys Gln Gln Gln Cys Glu
    210   215   220

Cys Val Arg Gly Arg Cys Ser Ala Ala Ser Gly Glu Cys Thr Cys Pro
225   230   235   240

Pro Gly Phe Arg Gly Ala Arg Cys Glu Leu Pro Cys Pro Ala Gly Ser
            245   250   255

His Gly Val Gln Cys Ala His Ser Cys Gly Arg Cys Lys His Asn Glu
            260   265   270

388

```
Pro Cys Ser Pro Asp Thr Gly Ser Cys Glu Ser Cys Glu Pro Gly Trp
    275                 280             285

Asn Gly Thr Gln Cys Gln Gln Pro Cys Leu Pro Gly Thr Phe Gly Glu
    290             295             300

Ser Cys Glu Gln Gln Cys Pro His Cys Arg His Gly Glu Ala Cys Glu
305             310             315             320

Pro Asp Thr Gly His Cys Gln Arg Cys Asp Pro Gly Trp Leu Gly Pro
            325             330             335

Arg Cys Glu Asp Pro Cys Pro Thr Gly Thr Phe Gly Glu Asp Cys Gly
        340             345             350

Ser Thr Cys Pro Thr Cys Val Gln Gly Ser Cys Asp Thr Val Thr Gly
        355             360             365

Asp Cys Val Cys Ser Ala Gly Tyr Trp Gly Pro Ser Cys Asn Ala Ser
    370             375             380

Cys Pro Ala Gly Phe His Gly Asn Asn Cys Ser Val Pro Cys Glu Cys
385             390             395             400

Pro Glu Gly Leu Cys His Pro Val Ser Gly Ser Cys Gln Pro Gly Ser
            405             410             415

Gly Ser Arg Asp Thr Ala Leu Ile Ala Gly Ser Leu Val Pro Leu Leu
            420             425             430

Leu Leu Phe Leu Gly Leu Ala Cys Cys Ala Cys Cys Cys Trp Ala Pro
        435             440             445

Arg Ser Asp Leu Lys Asp Arg Pro Ala Arg Asp Gly Ala Thr Val Ser
    450             455             460

Arg Met Lys Leu Gln Val Trp Gly Thr Leu Thr Ser Leu Gly Ser Thr
465             470             475             480

Leu Pro Cys Arg Ser Leu Ser Ser His Lys Leu Pro Trp Val Thr Val
            485             490             495
```

389

```
Ser His His Asp Pro Glu Val Pro Phe Asn His Ser Phe Ile Glu Pro
            500                 505                 510

Pro Ser Ala Gly Trp Ala Thr Asp Asp Ser Phe Ser Ser Asp Pro Glu
            515                 520                 525

Ser Gly Glu Ala Asp Glu Val Pro Ala Tyr Cys Val Pro Pro Gln Glu
            530                 535                 540

Gly Met Val Pro Val Ala Gln Ala Gly Ser Ser Glu Ala Ser Leu Ala
545                 550                 555                 560

Ala Gly Ala Phe Pro Pro Pro Glu Asp Ala Ser Thr Pro Phe Ala Ile
            565                 570                 575

Pro Arg Thr Ser Ser Leu Ala Arg Ala Lys Arg Pro Ser Val Ser Phe
            580                 585                 590

Ala Glu Gly Thr Lys Phe Ala Pro Gln Ser Arg Arg Ser Ser Gly Glu
            595                 600                 605

Leu Ser Ser Pro Leu Arg Lys Pro Lys Arg Leu Ser Arg Gly Ala Gln
            610                 615                 620

Ser Gly Pro Glu Gly Arg Glu Ala Glu Glu Ser Thr Gly Pro Glu Glu
625                 630                 635                 640

Ala Glu Ala Pro Glu Ser Phe Pro Ala Ala Ala Ser Pro Gly Asp Ser
            645                 650                 655

Ala Thr Gly His Arg Arg Pro Pro Leu Gly Gly Arg Thr Val Ala Glu
            660                 665                 670

His Val Glu Ala Ile Glu Gly Ser Val Gln Glu Ser Ser Gly Pro Val
            675                 680                 685

Thr Thr Ile Tyr Met Leu Ala Gly Lys Pro Arg Gly Ser Glu Gly Pro
            690                 695                 700

Val Arg Ser Val Phe Arg His Phe Gly Ser Phe Gln Lys Gly Gln Ala
705                 710                 715                 720
```

390

```
Glu Ala Lys Val Lys Arg Ala Ile Pro Lys Pro Pro Arg Gln Ala Leu
            725             730             735

Asn Arg Lys Lys Gly Ser Pro Gly Leu Ala Ser Gly Ser Val Gly Gln
            740             745             750

Ser Pro Asn Ser Ala Pro Lys Ala Gly Leu Pro Gly Ala Thr Gly Pro
        755             760             765

Met Ala Val Arg Pro Glu Glu Ala Val Arg Gly Leu Gly Ala Gly Thr
    770             775             780

Glu Ser Ser Arg Arg Ala Gln Glu Pro Val Ser Gly Cys Gly Ser Pro
785             790             795             800

Glu Gln Asp Pro Gln Lys Gln Ala Glu Glu Glu Arg Gln Glu Glu Pro
            805             810             815

Glu Tyr Glu Asn Val Val Pro Ile Ser Arg Pro Pro Glu Pro
            820             825             830
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<210> 141
<211> 3763
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (48)..(1139)
<223>

<400> 141
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gaggtcctcg actgtttcag tttttcactc ttagcatgaa tttggaa atg act ttt    56
                                                    Met Thr Phe
                                                    1

gat gac aag atg aag cct gcg aat gac gag cct gat cag aag tca tgt   104
Asp Asp Lys Met Lys Pro Ala Asn Asp Glu Pro Asp Gln Lys Ser Cys
    5              10              15

ggc aag aag cct aaa ggt ctg cat ttg ctt tcc tcc cca tgg tgg ttc   152
Gly Lys Lys Pro Lys Gly Leu His Leu Leu Ser Ser Pro Trp Trp Phe
20              25              30              35

cct gct gct atg act ctg gtc atc ctc tgc ctg gtg ttg tca gtg acc   200
Pro Ala Ala Met Thr Leu Val Ile Leu Cys Leu Val Leu Ser Val Thr
            40              45              50
```

391

```
ctt att gta cag tgg aca caa tta cgc cag gta tct gac ctc tta aaa        248
Leu Ile Val Gln Trp Thr Gln Leu Arg Gln Val Ser Asp Leu Leu Lys
        55              60              65

caa tac caa gcg aac ctt act cag cag gat cgt atc ctg gaa ggg cag        296
Gln Tyr Gln Ala Asn Leu Thr Gln Gln Asp Arg Ile Leu Glu Gly Gln
        70              75              80

atg tta gcc cag cag aag gca gaa aac gct tca cag gaa tca aag aag        344
Met Leu Ala Gln Gln Lys Ala Glu Asn Ala Ser Gln Glu Ser Lys Lys
    85              90              95

gaa ctg aaa gga aag ata gac acc ctc acc cag aag ctg aat gag aaa        392
Glu Leu Lys Gly Lys Ile Asp Thr Leu Thr Gln Lys Leu Asn Glu Lys
100             105             110             115

tcc aaa gag cag gag gag ctt cta cag aag aat cag aac ctc caa gaa        440
Ser Lys Glu Gln Glu Glu Leu Leu Gln Lys Asn Gln Asn Leu Gln Glu
            120             125             130

gcc ctg caa aga gct gca aac tct tca gag gag tcc cag aga gaa ctc        488
Ala Leu Gln Arg Ala Ala Asn Ser Ser Glu Glu Ser Gln Arg Glu Leu
            135             140             145

aag gga aag ata gac acc atc acc cgg aag ctg gac gag aaa tcc aaa        536
Lys Gly Lys Ile Asp Thr Ile Thr Arg Lys Leu Asp Glu Lys Ser Lys
            150             155             160

gag cag gag gag ctt ctg cag atg att cag aac ctc caa gaa gcc ctg        584
Glu Gln Glu Glu Leu Leu Gln Met Ile Gln Asn Leu Gln Glu Ala Leu
        165             170             175

cag aga gct gca aac tct tca gag gag tcc cag aga gaa ctc aag gga        632
Gln Arg Ala Ala Asn Ser Ser Glu Glu Ser Gln Arg Glu Leu Lys Gly
180             185             190             195

aag ata gac acc ctc acc ttg aag ctg aac gag aaa tcc aaa gag cag        680
Lys Ile Asp Thr Leu Thr Leu Lys Leu Asn Glu Lys Ser Lys Glu Gln
            200             205             210

gag gag ctt cta cag aag aat cag aac ctc caa gaa gcc ctg caa aga        728
Glu Glu Leu Leu Gln Lys Asn Gln Asn Leu Gln Glu Ala Leu Gln Arg
            215             220             225

gct gca aac ttt tca ggt cct tgt cca caa gac tgg ctc tgg cat aaa        776
Ala Ala Asn Phe Ser Gly Pro Cys Pro Gln Asp Trp Leu Trp His Lys
        230             235             240

gaa aac tgt tac ctc ttc cat ggg ccc ttt agc tgg gaa aaa aac cgg        824
Glu Asn Cys Tyr Leu Phe His Gly Pro Phe Ser Trp Glu Lys Asn Arg
        245             250             255

cag acc tgc caa tct ttg ggt ggc cag tta cta caa att aat ggt gca        872
Gln Thr Cys Gln Ser Leu Gly Gly Gln Leu Leu Gln Ile Asn Gly Ala
260             265             270             275
```

392

```
gat gat ttg aca ttc atc tta caa gca att tcc cat acc acc tcc ccg      920
Asp Asp Leu Thr Phe Ile Leu Gln Ala Ile Ser His Thr Thr Ser Pro
            280                 285                 290

ttc tgg att gga ttg cat cgg aag aag cct ggc caa cca tgg cta tgg      968
Phe Trp Ile Gly Leu His Arg Lys Lys Pro Gly Gln Pro Trp Leu Trp
            295                 300                 305

gag aat gga act cct ttg aat ttt caa ttc ttt aag acc agg ggc gtt     1016
Glu Asn Gly Thr Pro Leu Asn Phe Gln Phe Phe Lys Thr Arg Gly Val
        310                 315                 320

tct tta cag cta tat tca tca ggc aac tgt gca tac ctt caa gac gga    1064
Ser Leu Gln Leu Tyr Ser Ser Gly Asn Cys Ala Tyr Leu Gln Asp Gly
        325                 330                 335

gct gtg ttc gct gaa aac tgc att cta att gca ttc agc ata tgt cag    1112
Ala Val Phe Ala Glu Asn Cys Ile Leu Ile Ala Phe Ser Ile Cys Gln
340                 345                 350                 355

aag aag aca aat cat ttg caa att tag tgaatctaaa gattctggag          1159
Lys Lys Thr Asn His Leu Gln Ile
            360
```

```
aagaccatga gaagactttt gactgtcgct ctgaaattta agctattttt tattacctgc   1219

atgtaaagca tgttggcctt gacatctgtc agttacctga tagctacagt tcacctcatc   1279

aaagacaagg accagaagca aatactggtg gatccagatg tttgaaatct ttgtatcaaa   1339

acgtgtgagt tcaattgttt atccatatac actggccttg cccctccaaa gtctcccaac   1399

caacctgcac tccttcttcc cctttgtgtt ttaaatgatg cttcctgcct gacctggcca   1459

tgctttgtac tcagtctcct ctacctcagt atgcctcctg ttgctgcatg aaagacagga   1519

tgtagaaatc ctcctcaagt gcaggcagag ggctcaaagg caaagctcgt ccgagaaata   1579

acatgcaaag aaacagaact ggaaaaacta cactgcaaac aggaactcat gatctctaaa   1639

aagccatggc ttgatcttta tgacaggagt ccatctccag actgcacttt tacacacata   1699

tttttcattt tacttttatt gtgaagttta tggatagttt gcctacttga attctgtgta   1759

ccacatgagt gcctggtgcc actgaagatc agaagaggac atcagattct ctggatctgg   1819

aattccagat ggttgtaagc tgctatgtag atgtgaagaa ttgaattcgg tgtcccctgg   1879

aagaacagcc agtactcttt gccatgagct atctctcaag ctcctgtgat caattcttgt   1939

atcagttatg tctccatttt tgctctacca aagaacagtg ttataacttt aaaacagtaa   1999

gtattttcat tattctaggg gtaatatagc agatatagat agagatagag atagagatag   2059

agatagagat agagatagag atagagatag agatagagat aggtataggt ataggtatag   2119
```

393

```
gtataggtat aggtataggt ataggtatag gtataggtag atagagatag aggtagaggt    2179

agaggtagag gtagaggtag aggtagaggt agaggtagag atagagatag agatagagat    2239

agagatagag atagagatag agatagagat agagatagag atagagatag agatagagat    2299

agagatagag atagagatag agatagagat agatagtgtg tgtgtgcgtg tgtgtgtttc    2359

tatgctaggt acgatccttg aggagatgag acagttttgt gtgaaatgag tttgtaataa    2419

tccaaattta aaaataaatt cgatgattac ctgtagtggt catattacca cagccaagat    2479

gatgaacata cctgtcactt ctgcccccttc ccaaagcctc ctccctaaaa caaacaccaa    2539

tctgctttca gttcgcattt tatagagctt ctcattttgt ttttaagaca gaatctcata    2599

tagtcctggc tggcctggaa ctcactacac agagcaggct ggcctccacc ttctagagct    2659

cctcctgcca gactcccaaa ccttaagact gaaggagtgc cctgccgtgt gtgactcaaa    2719

caccttaatg tgaatggaac agcataagat gtccaggttt tttcagtcca gcttcttcca    2779

cttggtacaa tttttaattt ttgtgttcat acatctccac cacagtgttt gtatcagttc    2839

atcattcttt tcaaatgttg agccttcccc tgtggatcta tagtgtcatt tgttatctgt    2899

gtatttgttg atgccatttg ggttggtttt gtctggggtc acctacaaat aaagctgcta    2959

tggatgtcca tggacaaggc taatatctta ggtaagcacc tacgagtaag atgcttgggt    3019

cattcagtgt gggaatatat ggttggctat tttaaccatt cctgtttgaa aacattaatt    3079

tttttattt ttgaaatcaa ttttttaaaa aattaattag tctattttac atctcaaccc    3139

cagtttctct tcctcctctc ctctcaacct tctcccacct tctctccctg accccatcca    3199

cccctcctcc ctttctctcc agaagagggg aggcctccca tggatgccaa ccagcctcag    3259

catctcaagt tacagtaaga ataggtttgt cttctcctgt gaaaatctta atttttagat    3319

ttatctatta tatatgcagt actttgcttg cacatatgta ttggtaccat gtacatgcat    3379

ggtaccagag aaagtcagaa gaggccattg tattttctgg gactggaatt acagacgttt    3439

ttgaacaatc ctatagactc tgggaactga acccaggtcg tctggaaagg caagcagtgc    3499

tcttaacccc tgagccattt cttctggcct tttagcaatt tttattaata tataactgtg    3559

tatacttgca cttttagctc gaagttctta agtgtcaaat agtcttggat ttattttcat    3619

gttatcactg tctgtacaat ttctgtgatg aaataactga gcatatattt tgagaatttg    3679

gttttcttaa attttaaatc tgaaggattt acatatttga gaataaaaac cagccagata    3739

cataaaaaaa aaaaaaaaaa aaaa    3763
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394

<210> 142
<211> 363
<212> PRT
<213> Mus musculus

<400> 142

Met Thr Phe Asp Asp Lys Met Lys Pro Ala Asn Asp Glu Pro Asp Gln
1   5   10   15

Lys Ser Cys Gly Lys Lys Pro Lys Gly Leu His Leu Leu Ser Ser Pro
            20   25   30

Trp Trp Phe Pro Ala Ala Met Thr Leu Val Ile Leu Cys Leu Val Leu
        35   40   45

Ser Val Thr Leu Ile Val Gln Trp Thr Gln Leu Arg Gln Val Ser Asp
    50   55   60

Leu Leu Lys Gln Tyr Gln Ala Asn Leu Thr Gln Gln Asp Arg Ile Leu
65   70   75   80

Glu Gly Gln Met Leu Ala Gln Gln Lys Ala Glu Asn Ala Ser Gln Glu
                85   90   95

Ser Lys Lys Glu Leu Lys Gly Lys Ile Asp Thr Leu Thr Gln Lys Leu
            100   105   110

Asn Glu Lys Ser Lys Glu Gln Glu Glu Leu Leu Gln Lys Asn Gln Asn
        115   120   125

Leu Gln Glu Ala Leu Gln Arg Ala Ala Asn Ser Ser Glu Glu Ser Gln
    130   135   140

Arg Glu Leu Lys Gly Lys Ile Asp Thr Ile Thr Arg Lys Leu Asp Glu
145   150   155   160

Lys Ser Lys Glu Gln Glu Glu Leu Leu Gln Met Ile Gln Asn Leu Gln
                165   170   175

Glu Ala Leu Gln Arg Ala Ala Asn Ser Ser Glu Glu Ser Gln Arg Glu
            180   185   190

Leu Lys Gly Lys Ile Asp Thr Leu Thr Leu Lys Leu Asn Glu Lys Ser
        195   200   205

Lys Glu Gln Glu Glu Leu Leu Gln Lys Asn Gln Asn Leu Gln Glu Ala
        210   215   220

Leu Gln Arg Ala Ala Asn Phe Ser Gly Pro Cys Pro Gln Asp Trp Leu
225   230   235   240

Trp His Lys Glu Asn Cys Tyr Leu Phe His Gly Pro Phe Ser Trp Glu
                245   250   255

Lys Asn Arg Gln Thr Cys Gln Ser Leu Gly Gly Gln Leu Leu Gln Ile
                260   265   270

Asn Gly Ala Asp Asp Leu Thr Phe Ile Leu Gln Ala Ile Ser His Thr
        275   280   285

Thr Ser Pro Phe Trp Ile Gly Leu His Arg Lys Lys Pro Gly Gln Pro
        290   295   300

Trp Leu Trp Glu Asn Gly Thr Pro Leu Asn Phe Gln Phe Phe Lys Thr
305   310   315   320

Arg Gly Val Ser Leu Gln Leu Tyr Ser Ser Gly Asn Cys Ala Tyr Leu
                325   330   335

Gln Asp Gly Ala Val Phe Ala Glu Asn Cys Ile Leu Ile Ala Phe Ser
        340   345   350

Ile Cys Gln Lys Lys Thr Asn His Leu Gln Ile
        355   360

<210> 143
<211> 1102
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (44)..(1102)
<223>

396

<400> 143

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gcgtcgacgt cttgccaccg catctggaga accagcggtt acc atg gag ggg atc        55
                                                Met Glu Gly Ile
                                                1


agt ata tac act tca gat aac tac acc gag gaa atg ggc tca ggg gac       103
Ser Ile Tyr Thr Ser Asp Asn Tyr Thr Glu Glu Met Gly Ser Gly Asp
5                  10                  15                  20


tat gac tcc atg aag gaa ccc tgt ttc cgt gaa gaa aat gct aat ttc       151
Tyr Asp Ser Met Lys Glu Pro Cys Phe Arg Glu Glu Asn Ala Asn Phe
                  25                  30                  35


aat aaa atc ttc ctg ccc acc atc tac tcc atc atc ttc tta act ggc       199
Asn Lys Ile Phe Leu Pro Thr Ile Tyr Ser Ile Ile Phe Leu Thr Gly
              40                  45                  50


att gtg ggc aat gga ttg gtc atc ctg gtc atg ggt tac cag aag aaa       247
Ile Val Gly Asn Gly Leu Val Ile Leu Val Met Gly Tyr Gln Lys Lys
              55                  60                  65


ctg aga agc atg acg gac aag tac agg ctg cac ctg tca gtg gcc gac       295
Leu Arg Ser Met Thr Asp Lys Tyr Arg Leu His Leu Ser Val Ala Asp
          70                  75                  80


ctc ctc ttt gtc atc acg ctt ccc ttc tgg gca gtt gat gcc gtg gca       343
Leu Leu Phe Val Ile Thr Leu Pro Phe Trp Ala Val Asp Ala Val Ala
85                  90                  95                  100


aac tgg tac ttt ggg aac ttc cta tgc aag gca gtc cat gtc atc tac       391
Asn Trp Tyr Phe Gly Asn Phe Leu Cys Lys Ala Val His Val Ile Tyr
                  105                 110                 115


aca gtc aac ctc tac agc agt gtc ctc atc ctg gcc ttc atc agt ctg       439
Thr Val Asn Leu Tyr Ser Ser Val Leu Ile Leu Ala Phe Ile Ser Leu
              120                 125                 130


gac cgc tac ctg gcc att gtc cac gcc acc aac agt cag agg cca agg       487
Asp Arg Tyr Leu Ala Ile Val His Ala Thr Asn Ser Gln Arg Pro Arg
          135                 140                 145


aag ctg ttg gct gaa aag gtg gtc tat gtt ggc gtc tgg atc cct gcc       535
Lys Leu Leu Ala Glu Lys Val Val Tyr Val Gly Val Trp Ile Pro Ala
          150                 155                 160


ctc ctg ctg act att ccc gac ttc atc ttt gcc aac gtc agt gag gca       583
Leu Leu Leu Thr Ile Pro Asp Phe Ile Phe Ala Asn Val Ser Glu Ala
165                 170                 175                 180


gat gac aga tat atc tgt gac cgc ttc tac ccc aat gac ttg tgg gtg       631
Asp Asp Arg Tyr Ile Cys Asp Arg Phe Tyr Pro Asn Asp Leu Trp Val
                  185                 190                 195
```

397

```
gtt gtg ttc cag ttt cag cac atc atg gtt ggc ctt atc ctg cct ggt        679
Val Val Phe Gln Phe Gln His Ile Met Val Gly Leu Ile Leu Pro Gly
            200             .   205             210

att gtc atc ctg tcc tgc tat tgc att atc atc tcc aag ctg tca cac        727
Ile Val Ile Leu Ser Cys Tyr Cys Ile Ile Ile Ser Lys Leu Ser His
            215             220             225

tcc aag ggc cac cag aag cgc aag gcc ctc aag acc aca atc atc ccc        775
Ser Lys Gly His Gln Lys Arg Lys Ala Leu Lys Thr Thr Ile Ile Pro
        230             235         .   240

atc ctg gct ttc ttc gcc tgt tgg ctg cct tac tac att ggg atc agc        823
Ile Leu Ala Phe Phe Ala Cys Trp Leu Pro Tyr Tyr Ile Gly Ile Ser
245             250             255             260

atc gac tcc ttc atc ctc ctg gaa atc atc aag caa ggg tgt gag ttt        871
Ile Asp Ser Phe Ile Leu Leu Glu Ile Ile Lys Gln Gly Cys Glu Phe
            265             270 ·           275

gag aac act gtg cac aag tgg att tcc atc acc gag gcc cta gct ttc        919
Glu Asn Thr Val His Lys Trp Ile Ser Ile Thr Glu Ala Leu Ala Phe
            280             285             290 ·

ttc cac tgt tgt ctg aac ccc atc ctc tat gct ttc ctt gga gcc aaa        967
Phe His Cys Cys Leu Asn Pro Ile Leu Tyr Ala Phe Leu Gly Ala Lys
            295             300             305

ttt aaa acc tct gcc cag cac gca ctc acc tct gtg agc aga ggg tcc        1015
Phe Lys Thr Ser Ala Gln His Ala Leu Thr Ser Val Ser Arg Gly Ser
    310             315             320

agc ctc aag atc ctc tcc aaa gga aag cga ggt gga cat tca tct gtt       1063
Ser Leu Lys Ile Leu Ser Lys Gly Lys Arg Gly Gly His Ser Ser Val
325     .           330             335             340

tcc act gag tct gag tct tca agt ttt cac tcc agc taa                   1102
Ser Thr Glu Ser Glu Ser Ser Ser Phe His Ser Ser
            345             350
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<210>  144
<211> '352
<212>  PRT
<213>  Homo sapiens

<400>  144

Met Glu Gly Ile Ser Ile Tyr Thr Ser Asp Asn Tyr Thr Glu Glu Met
1   ·             5                 10                  15


Gly Ser Gly Asp Tyr Asp Ser Met Lys Glu Pro Cys Phe Arg Glu Glu
            20              25              30
```

398

```
Asn Ala Asn Phe Asn Lys Ile Phe Leu Pro Thr Ile Tyr Ser Ile Ile
     35              40              45

Phe Leu Thr Gly Ile Val Gly Asn Gly Leu Val Ile Leu Val Met Gly
     50              55              60

Tyr Gln Lys Lys Leu Arg Ser Met Thr Asp Lys Tyr Arg Leu His Leu
65              70              75              80

Ser Val Ala Asp Leu Leu Phe Val Ile Thr Leu Pro Phe Trp Ala Val
             85              90              95

Asp Ala Val Ala Asn Trp Tyr Phe Gly Asn Phe Leu Cys Lys Ala Val
             100             105             110

His Val Ile Tyr Thr Val Asn Leu Tyr Ser Ser Val Leu Ile Leu Ala
             115             120             125

Phe Ile Ser Leu Asp Arg Tyr Leu Ala Ile Val His Ala Thr Asn Ser
     130             135             140

Gln Arg Pro Arg Lys Leu Leu Ala Glu Lys Val Val Tyr Val Gly Val
145             150             155             160

Trp Ile Pro Ala Leu Leu Leu Thr Ile Pro Asp Phe Ile Phe Ala Asn
             165             170             175

Val Ser Glu Ala Asp Asp Arg Tyr Ile Cys Asp Arg Phe Tyr Pro Asn
             180             185             190

Asp Leu Trp Val Val Val Phe Gln Phe Gln His Ile Met Val Gly Leu
         195             200             205

Ile Leu Pro Gly Ile Val Ile Leu Ser Cys Tyr Cys Ile Ile Ile Ser
     210             215             220

Lys Leu Ser His Ser Lys Gly His Gln Lys Arg Lys Ala Leu Lys Thr
225             230             235             240

Thr Ile Ile Pro Ile Leu Ala Phe Phe Ala Cys Trp Leu Pro Tyr Tyr
             245             250             255
```

399

```
Ile Gly Ile Ser Ile    Ser Phe Ile Leu Leu Glu Ile I    s Gln
          260                    265                 270

Gly Cys Glu Phe Glu Asn Thr Val His Lys Trp Ile Ser Ile Thr Glu
          275                 280                 285

Ala Leu Ala Phe Phe His Cys Cys Leu Asn Pro Ile Leu Tyr Ala Phe
     290                 295                 300

Leu Gly Ala Lys Phe Lys Thr Ser Ala Gln His Ala Leu Thr Ser Val
305                 310                 315                 320

Ser Arg Gly Ser Ser Leu Lys Ile Leu Ser Lys Gly Lys Arg Gly Gly
               325                 330                 335

His Ser Ser Val Ser Thr Glu Ser Glu Ser Ser Ser Phe His Ser Ser
          340                 345                 350
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<210>  145
<211>  31
<212>  DNA
<213>  Unknown

<220>
<223>  Primer

<400>  145
ctccaagctt tgvccagcga gaaaagcgaa g                              31


<210>  146
<211>  45
<212>  DNA
<213>  Unknown

<220>
<223>  Primer

<400>  146
gcctcctgca gatccaccgc ctccggatgt atataaatat atatc              45


<210>  147
<211>  30
<212>  DNA
<213>  Unknown

<220>
<223>  Primer
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400

<400> 147
gcctcctgca gatgtatata aacatatatc   30

<210> 148
<211> 13
<212> PRT
<213> Homo sapiens

<400> 148

Ser Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Asn Asn
1   5   10

<210> 149
<211> 66
<212> PRT
<213> Homo sapiens

<400> 149

Met Asn Ala Ala Ala Ser Gly Pro Ser Asn Thr Pro Pro Glu Ile Ala
1   5   10   15

Ala Ala Arg Ala His Tyr Asn Ile Val Thr Phe Ala Ala Ala Ile Tyr
                20   25   30

Lys Lys Ser Gln His Met Ala Ala Ala Val Asn Ile Arg Asn Cys Cys
        35   40   45

Tyr Ile Ala Ala Ala Ser Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu
    50   55   60

Asn Asn
65

<210> 150
<211> 27
<212> DNA
<213> Unknown

<220>
<223> Primer

<400> 150
agcttggctg ttccgccatg gctcgag   27

401

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<211>  36
<212>  DNA
<213>  Unknown

<220>
<223>  Primer

<400>  151
ccgaattcaa gcttagatgc tctagcaaaa gccaag                              36


<210>  152
<211>  39
<212>  DNA
<213>  Unknown

<220>
<223>  Primer

<400>  152
cccctgcagt taggatccct cgagaggtaa aatttcatc                           39


<210>  153
<211>  30
<212>  DNA
<213>  Unknown

<220>
<223>  Primer

<400>  153
ccgaattctc gaggctccta aagaaaatac                                     30


<210>  154
<211>  41
<212>  DNA
<213>  Unknown

<220>
<223>  Primer

<400>  154
ccaagcttgg atcctgcgca gatcttggtg ttggtttttt g                        41


<210>  155
<211>  21
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<213>  Unknown

<220>
<223>  Primer
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402

<400> 155
aattaccatg gaattcctgc   21

<210> 156
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<212> DNA
<213> Unknown

<220>
<223> Primer

<400> 156
tggtacctta agg   13

<210> 157
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<212> DNA
<213> Unknown

<220>
<223> Primer

<400> 157
actctagagt tcgatctccc ttgcagcag   29

<210> 158
<211> 29
<212> DNA
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<220>
<223> Primer

<400> 158
acagatctgt tcgatctccc ttgcagcag   29

<210> 159
<211> 25
<212> DNA
<213> Unknown

<220>
<223> Primer

<400> 159
ctcggatccc tggcacctct aaccc   25

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<211>  24
<212>  DNA
<213>  Unknown

<220>
<223>  Primer

<400>  160
ggtctagaac cctcaaacaa gccc                                              24


<210>  161
<211>  36
<212>  DNA
<213>  Unknown

<220>
<223>  Primer

<400>  161
acatgcatgc actagtgcgc gcgttgacat tgatta                                 36


<210>  162
<211>  36
<212>  DNA
<213>  Unknown

<220>
<223>  Primer

<400>  162
acatgcatcc atgtgagagc tctgcttata tagacc                                 36


<210>  163
<211>  4
<212>  PRT
<213>  Unknown

<220>
<223>  Consensus sequence

<400>  163

Cys Val Ile Ala
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<210>  164
<211>  6
<212>  PRT
<213>  Unknown
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<223>   Xaa can be any amino acid

<220>
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<223>   Xaa can be any amino acid

<400>   164

Leu Pro Xaa Thr Gly Xaa
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<210>   165
<211>   6
<212>   PRT
<213>   Homo sapiens

<400>   165

Val Thr Tyr Ala Gln Leu
1                   5


<210>   166
<211>   6
<212>   PRT
<213>   Homo sapiens

<400>   166

Ile Val Tyr Glu Leu Leu
1                   5
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